TECHNICAL SPECIFICATIONS

WASHINGTON STATE FERRIES

M.V. HYAK DOCKSIDE PRESERVATION

CONTRACT NO. 00-7039

TECHNICAL SPECIFICATIONS

TABLE OF CONTENTS

ITEM **PAGE**

ITEM **PAGE**

WASHINGTON STATE FERRIES

M.V. HYAK DOCKSIDE PRESERVATION

CONTRACT NO. 00-7039

TECHNICAL SPECIFICATIONS

For the following Technical Specifications, the Contractor is to provide all labor, material and equipment to accomplish each and every Bid Item unless otherwise specified.

The Specification Item sub-titles in brackets are for WSF internal use only, for Life Cycle Cost modeling. Bidders should ignore such bracketed sub-titles.

1. BERTH VESSEL

[MAINTENANCE]

A. M.V. Hyak Vessel Particulars: Length: 382' 2", Beam: 73' 2", Draft: 18' 6", Gross Tons: 2704.

B. Provide labor, material, and equipment to berth the Vessel for accomplishment of the Work specified herein, and any necessary repair.

C. When the terms forward, aft, port or starboard are used, No. 1 End is to be considered the bow.

2. TEMPORARY SERVICE

[MAINTENANCE]

A. Install one (1) telephone on board in a location designated by the Vessel Staff Chief Engineer. The telephone is to have one (1) outside line with toll-free access to Seattle and vicinity and, if different, one (1) line for local numbers. The telephone shall have touch-tone service if available from the Contractor's telephone system.

B. Provide and maintain electricity, water, sewage removal, safe lighted gangway and trash removal services while Vessel is in the Contractor's facility. Estimate 15,000 gallons of accumulated sewage generated while at the Contractor’s facility.

C. Provide temporary lighting and ventilation throughout the Vessel during the time that Vessel electrical systems will be inoperable in the course of this Work. Temporary lighting levels shall be at least equal to those lighting levels provided by the installed lighting. Temporary connections directly into the lighting transformers are authorized. Provide temporary connections to main motor and propulsion generator heaters, No. 1 and 2 Ends davit control heaters, one (1) potable water pump and one (1) ships service boiler to maintain heat on the Vessel. Show all temporary connections to the Vessel Staff Chief and the WSF Inspector prior to energizing.

D. Provide temporary power to the pilothouse 24VDC, TEP and Engine Room 24 VDC systems battery chargers.

E. Provide Safety and Security for the entire Vessel throughout the construction, repair or preservation period until such time as the WSF Inspector has accepted re-delivery of the Vessel. Every reasonable precaution shall be taken to protect the Vessel from the hazards of fire, flooding, pilferage, malicious damage, and other events including cataclysmic phenomena of nature.

F. Clean and gas free all spaces and tanks associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK". Maintain the certificates during the course of the Work for all Work Items of this Contract.

G. Provide and maintain comprehensive and effective fire prevention and fire detection, and fire fighting programs and systems sufficient to ensure the safety and integrity of the Vessel. Provide personnel trained in shipboard fire fighting techniques and also trained to cooperate with, and assist, local fire fighting organizations. Provide sufficient shore fire lines to ensure an adequate supply of fire fighting water, at sufficient pressure, and maintain an adequate number of tested fire-hoses aboard the Vessel to effectively fight fires from two (2) directions at any location in the Vessel.

H. Provide space on the pier adjacent to the Vessel for a WSF supplied 20' container the Vessel Staff Chief will use for storage.

I. Provide and maintain portable fire extinguishers in sufficient quantity, and of the appropriate type, to combat local fires of any Class. Provide sufficient fire watches, including roving watches as may be required, to ensure that fires that may be inadvertently started by welding sparks or heat, electrical malfunction, or spontaneous combustion are detected, reported and promptly extinguished.

J. The Contractor shall provide and maintain rigid control of welding and grounding for the protection of the hull, hull systems, and appendages during the entire time the Vessel is in the custody of the Contractor. The Vessel shall be properly grounded throughout the period of the Contract except when the Vessel is underway for Trials. There shall be no welding or air arcing undertaken aboard the Vessel until a hull corrosion protection system has been installed to the satisfaction of the WSF Representative and hull ground cables are installed. Provide and maintain zinc anodes for hull corrosion protection.

1. Hull potential readings shall be taken twice daily until satisfactory potentials have been obtained and at least weekly thereafter. The Contractor shall maintain a written log that indicates the station at which each reading was taken, the amplitude and polarity of the reading, the time and date, and the name of the individual making the readings. This record shall be made available to the WSF Representative upon request.

2. Provide an exact copy of the hull potential log, to date, to the WSF Representative in conjunction with progress billings. Progress payments WILL NOT be made until the required hull potential logs have been received by the WSF Representative.

3. The total cross-sectional area of hull ground wire shall be one million circular mils minimum per 1,000 amperes per 100 feet.

NOTE:
Hull potential shall be maintained in the range of +.75 to .9 V as measured on a certified U.S. Filter Electro Catalytic corrosion potential meter, silver-silver chloridem Model 33419-3. This shall be the only meter used to measure hull potential.

SUPPLEMENTAL SPECIFICATIONS

PAINTING OF VESSEL AND HULL PRESERVATION

(ATTACHMENT NO. 1)

MARINE COATING SPECIFICATIONS AND COLOR SCHEME

Area Preparation, Surface Preparation, Grit Blasting, Paint Coatings, and Inspection for Vessel's hull, curtain plates, casing and super structure shall be in accordance with Washington State Ferries' Marine Coating Specification, 01/03 unless otherwise specified in the following Specifications.

ELECTRICAL INSTALLATION SPECIFICATION

(ATTACHMENT NO. 2)

REV 09/02

All electrical installations shall be in accordance with Attachment No. 2, WSF 002 Electrical Installation Specifications, unless otherwise specified in the following Specifications.

GENERAL CONSTRUCTION REQUIREMENTS

(ATTACHMENT NO. 3)

Details of all piping, structural and electrical installations shall be in accordance with Attachment No. 3, WSF 003 General Construction Requirements, unless otherwise specified in the following Specifications.

REMOVAL CATEGORIES AND REQUIREMENTS

(ATTACHMENT NO. 4)

Disposition of all removed material shall be in accordance with Attachment No. 4, WSF 004, unless otherwise specified in the following Specifications.

3. MAIN PROPULSION ENGINE REPLACEMENT [PROPULSION SYSTEM]

NOTE:
This Work Item covers the removal of the four (4) ship main propulsion diesels and their replacement with WSF furnished units. Each set has an engine mounted on a common skid with a generator.

A. GENERAL:

1. The Work Item describes the replacement of the four (4) Main Propulsion Engines.

2. The replacement of the four (4) Main Propulsion Engines shall be accomplished in accordance with this specification and the following drawings:

   VOL II Dwg 5317-051-02 MV KALEETAN Main Propulsion Diesel Generator Foundation Modification.

   VOL II Dwg. 8201-652-062-01. MV HYAK Main Engine Spring Hanger Mods.

B. REMOVAL

1. Clean and gas free all spaces associated with the Work as necessary, and obtain a Marine Chemist Certificate for "SAFE FOR HOT WORK". Maintain the certificate during the course of the work.

2. Prior to commencing exhaust-piping removal, the Contractor shall sample insulation and gasket material to be affected by the removal and have the samples analyzed for ACM. The Contractor will develop a detailed mitigation plan for all ACM uncovered by sampling. The mitigation plan will detail removal, cleanup, and disposal of ACM and any related debris and scrap, and shall be in accordance with all existing environmental and health regulations. A plan approved by appropriate environmental agency shall be provided to WSF.

3. Develop and submit to the WSF Inspector for approval a detailed written Removal Plan outlining the procedure for the removal of the four (4) existing main Propulsion Diesels and the installation of the new Propulsion Diesel Engines. The Vessel has four (4) General Motors EMD 16-567E5 Propulsion Diesel Engines, each coupled to a Westinghouse Marine D.C. Generator on a common mounting skid. Two (2) Propulsion Diesel Generator sets are installed in each engine room. Indicate any temporary shoring, location of all lifting devices (their attachment points), the loads upon lifting devices at their anchor points, and the intended removal/replacement route (including location of cuts in Vessel structure).

Describe the procedures that will be taken to properly support each Propulsion Generator armature when the engine is decoupled from the drive shaft per Siemens Westinghouse recommendations (Note: each Generator is supported by a single, pedestal-type, self-lubricated sleeve bearing on the commutator end of the unit). This plan shall also address the Vessel's stability and hull strength considering all of the removals required by the Contract Work and the shipping cuts to be made. The Contractor may, at his option, add weight to correct the list as necessary during the Contract Work. The Contractor is responsible for all calculations to support list control.

NOTE:

Unit weight of an existing, complete diesel engine generator set (including skid) is approximately 65,450 lbs (Dry). Weight of each existing engine alone is approximately 36,150 lbs (Dry). Weight of each new propulsion diesel engine is approximately 37,695 lbs (Dry).

4. Prior to interference removal and the disconnection of support system piping, provide the services of a qualified technician to disable and disconnect the Engine Room CO2 system. CO2 system openings shall be immediately covered per Work Item 3.A.7.

5. Note and map the location of all interferences prior to removal of the Propulsion Diesel Engines. Remove all necessary interferences and reinstall on completion of work. This may include, but not be limited to, ventilation ducting, CO2 system piping, lighting, and electrical cableways. The forward and after sections of the exhaust manifold may also have to be removed for access to lifting points. If they are removed the manifolds will be reassembled on the removed engines using new gaskets on the pier prior to shipping. Temporary removal of the jacket water expansion tank for each Propulsion Diesel Engine will be required. Any openings in piping or equipment shall be immediately covered. Protect all areas in the vicinity of hot work. Moved and/or reinstalled interferences shall be re-insulated and preserved in same manner as original installation.

6. Modify, reroute, and relocate, in a location designated by the Vessel Staff Chief Engineer, any lights, pipes, alarms, vents, remote operators, hose reels or other equipment that will interfere with the clear opening. Remove and store aluminum deck plates in way of engine and piping work. Provide safe, temporary wood deck plates. Cover and protect from damage during shipyard activities all deck plates that are not removed.

7. Thoroughly drain and properly dispose of lube oil, water, and fuel to/from each engine.

NOTE:

The jacket water contains PENCOOL additive.

8. Disconnect all support system and drain connections on the engines including (but not limited to), start air, lube oil, fuel oil, raw water, fresh water, and engine exhaust. Disconnect all relevant gauge lines and engine

control and monitoring systems. Disconnect and remove the air intake filter box from each engine and retain for installation on the new engines. The Contractor shall immediately cover with blank flanges, plugs, or caps all engine and shipboard openings (including air intake and exhaust ports) to prevent contaminates from entering the engine or any piping system, and to prevent liquids from leaking out. Any engine opening or shipboard system piping left exposed to contamination will require a complete system flush as directed by the WSF Representative.

9. Disconnect, protect and remove the local control panels. These panels will be reinstalled after completion of engine replacement.

10. The existing thermocouple cable, enclosures, and wire way support track shall be saved and reinstalled on the new main engines.

11. Disconnect and protect or replace all gauge connections, except that all fuel gauge lines shall be changed to seamless stainless steel tubing.

12. Block engine skids and remove all existing isolation mounts (12 Korfund KMIG mounts per diesel engine generator set; remove and dispose as **Category "D").**

13. Disconnect the air starting motor from the start air system and remove the starting motor from the side of each engine as **Category "A**". Disconnect and remove the turbocharger soak back pump and soak back filter from each engine. Retain for reinstallation on the new engines.

14. Retain existing Jacket Water flexible connections from the cooler to the engine, for later reinstallation.

15. Remove as **Category "C"** the raw water pump from each engine for reinstallation on the new engines. Inspect and overhaul each removed raw water pump (an EMD item), including the replacement of existing wearing rings, bearings, seals, and gaskets with new EMD parts. Inspect the pump impeller and shaft for excessive wear or damage and notify the WSF representative of impeller condition.

16. Disconnect each propulsion diesel engine from its attached generator. Generator shall remain mounted to the skid. Provide sufficient support for the Generator armature in accordance with the Removal Plan.

17. If condensation is possible, the generator heaters shall be made operational or an auxiliary source of heat shall be applied to the generator.

18. Remove the four (4) existing General Motors EMD 16-567E5 main propulsion diesels located in the engine rooms in accordance with the approved Removal Plan. Notify WSF at least forty-eight (48) hours in advance of any movement to allow the WSF representative to be present for each lift or movement. Dispose of the units as **Category "A"** with additional handling requirements per this Work Item. Engines shall be covered with waterproof tarps and protected from the weather and other

damage at all times while out of the Vessel.

19. The Contractor shall provide cradles or skids for safe, effective handling and transport of each engine.

20. Transport the engines to the WSF warehouse at Todd Pacific Shipyard (Harbor Island, Seattle, WA) and offload the engines as directed by WSF. Notify WSF at least forty-eight (48) hours in advance of transporting the engines to allow the WSF Representative to be present and for coordination with Todd Pacific Shipyard. The engines and any attached components shall be adequately protected against damage during transport and handling.

C. PROPULSION DIESEL INSTALLATION

1. Install four (4) WSF furnished General Motors, EMD 16-645E5 Diesel Engines in accordance with this Specification. The Diesel Engines sets will be delivered to the Contractor's facility. During installation of the Diesel Engines do not tilt more than 30 deg.

2. Coordinate the engine installation with the bilge area painting required in a separate Work Item.

3. Unload the engines from WSF provided transportation. Inventory all parts shipped with the engines. Provide an inspection and inventory report to the WSF Representative upon receipt of the units. Store the new units in a dry, heated environment at all times.

NOTE:
New diesel engine weight is approximately 37,695 lbs (Dry).

4. Engines are to be placed on the existing skids. Clean the existing skids and thoroughly inspect for damage, deformation or cracking. Prime and repaint the disturbed skid areas to match the surrounding structure. New mounting hardware, including Grade eight (8) forged steel mounting bolts, shall be used. Mounting bolts shall be torqued in accordance with the engine manufactures recommendation and double nutted with the nut end up. The last nut shall be a self-locking type.

5. Prior to landing the Diesel Engines, provide and install new Lo-Rez BR4-MS vibration isolators between each Propulsion Diesel Generator skid and the ship's structure. **VOL II** Dwg 5317-051-02 is provided as illustrative guidance for locating the isolators. The existing skids shall be modified as required to accommodate installation of the new isolators. Isolator removal and installation shall be accomplished with the Generators remaining mounted to the skids.

6. Connect and align the Engines to the Generators using EMD and Siemens Westinghouse recommended procedures. All new drive shaft coupling bolts and related coupling hardware per EMD recommendations shall be used. At least two (2) weeks prior to landing the Engines, submit a written plan to the WSF Representative for approval detailing the alignment

procedure and allowable tolerances. The plan shall fully encompass the requirements of EMD and Siemens Westinghouse, and shall include as a minimum (1) Generator air gap readings, (2) Coupling flange run-out readings, (3) Generator bearing clearance at aft bearing, and (4) Requirements for verification of bearing contact patterns. Final alignment checks shall only be undertaken after all piping (including the exhaust system), major cables, and other major attachments have been made to the Engine and Generator. The Contractor shall provide the services of Diehl Engineering to conduct final alignment verification.

7. Install / reconnect all auxiliary piping systems and support equipment to the new Diesel Engines. Modify as required to connect to the new engines. Unless otherwise specified, all existing flexible connections shall be renewed in kind and appropriately sized for the connection required. New expansion joints for the scavenging lube oil outlet, fresh water inlet, raw water pump inlet, and fresh water outlet for each engine shall be a Holz Super Sphere Style 530 Viton expansion joint. All piping and tubing must be installed without springing or forcing into place. Flange faces shall be parallel and in axial alignment before bolting.

8. Reinstall previously removed Jacket Water flexible connections from the cooler to the engine, using new fasteners and gaskets.

9. Reinstall overhauled raw water pumps.

10. After all engine connections are complete (including the main engine exhaust system) and jacket water and WSF furnished lubricating oil are at proper operating levels, the Contractor shall adjust the resilient mounts in accordance with the manufacturer's instructions. The resilient mounts shall remain fully loaded for at least 48 hours and then readjusted to ensure proper preloading prior to beginning the diesel engine to alternator alignment process.

D. SYSTEMS MODIFICATIONS

1. Remove existing and install new orifice plates in the discharge line from each main engine raw water pump. New orifice plates shall be sized from existing orifice plates following their removal and fabricated from 316 S.S. New orifice plates shall be fabricated with projecting tabs that are clearly stamped with the orifice size.

2. Remove existing and install new orifice plates on the discharge side of the fresh water outlet expansion joint from each main engine. New plates shall be fabricated with a six inch (6") diameter orifice, equivalent to the inside diameter of the expansion joint outlet. New orifice plates shall be fabricated from 316 S.S. and shall have projecting tabs that are clearly stamped with the orifice size.

3. Disconnect and remove the engine pyrometers from the exhaust manifold. Replace exhaust manifold insulation blankets. Remove pyrometer gutter

box mounting brackets from old engine exhaust manifold and attach to new manifold. Install gutter box and make up pyrometer connections. Label all pyrometer connections. Calibrate all pyrometers.

4. Remove the existing AMOT Model 4B thermostatic valve from the fresh water-cooling circuit for each engine and replace with a new AMOT Model 6HMSF18501 thermostatic valve. Modify the existing four (4) inch Nom. Sch 40 pipe connected to the thermostatic valve ports (from the engine, to the cooler, and bypassing the cooler) to accommodate the six (6) inch bolted flange connections on each new AMOT Model 6H valve. Relocate the existing bulkhead mounted pipe bracket for each AMOT valve bypass line to accommodate installation of the new AMOT valves. Concentric reducers and long radius elbows shall be used to minimize flow losses.

5. Modify as required and reconnect the existing exhaust system (20" Nom., Sch. 10, ASTM A-53 steel pipe) to each newly installed main engine. All new gaskets shall be used. Provide and install a new vertical turbocharger exhaust adapter (an EMD part; no substitutions authorized) at each turbocharger outlet.

6. Install new exhaust spring hanger on each engine as shown on **VOL II** Dwg. 8201-652-062-01. **(Drawing provided by IFB Addendum)**

NOTE:
No portion of the exhaust system static weight (cold condition) shall be supported by the turbocharger or turbocharger exhaust adapter. Loads on the turbocharger resulting from exhaust system fit-up misalignment are not permitted.

7. Insulate all new and disturbed exhaust piping with removable blankets consisting of the following:

   a) Jacketing 304 SS wire mesh.

   b) Barrier Silicon impregnated 16-oz fiberglass cloth.

   c) Insulation 3" needled type E type fiberglass or ceramic fiber mat.

   d) Liner 304 SS wire mesh or SS foil.

   e) Securing 304 SS lacing hooks and wire.

   f) Seam fasteners Hog ring staples and Teflon coated SS thread.

   g) Materials containing asbestos shall not be used.

8. Renew all remote reading thermometers including thermo bulbs and capillary tubes from the engines to EOS.

9. Reconnect all gauge lines and engine monitoring systems.

10. New gaskets and seals shall be used for all connections. Teflon tape shall not be permitted for threaded connections.

11. Flush and hydrostatic test all modified systems in accordance with the

Specifications and the requirements of 46 CFR. No leaks allowed.

12. Prepare and paint all new and disturbed piping, structure, and equipment to match existing installations.

E. TESTING

1. WSF will provide the services of an EMD Factory Representative for verification of start up and testing. The Factory Representative shall be present at light off, during the main propulsion diesel engine and generator tests, dock trials, and sea trials. Provide at least two (2) weeks notification to the WSF representative prior to these events.

2. Prior to initial start up, conduct engine to generator alignment checks as required by the engine manufactures instructions after all service connections are made, and lube oil and jacket water are at operating levels. Correct any out of tolerance conditions. No welding to the skid shall be allowed after the final alignment check has been completed.

3. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices. WSF will provide an operating crew, available for main propulsion diesel generator set operation in support of control system testing and check out during dock trials and sea trials.

4. Prepare Test Memoranda using the manufacturers specification as guidance for the Contractor's Test Procedure.

5. Test Requirements:

a. Main engines shall not be started or turned over with starting air without the approval of the Factory Representative and the Staff Chief Engineer.

b. Initial start-up and no-load testing of the main engines shall be accomplished by the Contractor under the supervision of the Factory Representative and the Staff Chief Engineer.

c. No-load testing shall demonstrate, at a minimum, the following:

1. Proper operation of start and stop controls both at the unit and at the remote stations.

2. Proper function of the governor speed control system (both at the unit and at the remote stations).

3. Normal operation of all meters, gages, and alarms.

4. Proper temperatures and pressures maintained during the tests.

5. Proper functioning of all safety and shutdown devices.

6. Proper operation of all engine attached accessories.

7. Proper functioning of prelube and postlube.

8. See Work Item TESTING, Dock Trial and Sea Trial for load testing.

9. Conduct required testing in the presence of WSF and USCG Inspectors, and the Vessel Staff Chief Engineer.

4. REPLACE SHIP SERVICE DIESEL GENERATORS [PROPULSION SYSTEM]

A. General:

1. The Work Item describes the replacement of the two (2) Ship Service Generators.

2. The replacement of the two (2) Ship Service Generators shall be accomplished in accordance with this Specification.

B. Disconnect all services and remove the existing No. 1 and No. 2 Ship Service Diesel Generator sets, and replace them with overhauled, WSF furnished Ship Service Diesel Generator sets. Install the Owner Furnished Materials. The Contractor will pick up the generator at the WSF Eagle Harbor facility. The overhauled Ship Service Diesel Generator sets are in-kind to the existing.

NOTE:
All welding qualifications, procedures, and certifications shall meet the requirements for welding as set forth in Attachment 2 of this Specification.

C. Develop and submit to the WSF Inspector for approval a detailed written plan outlining the procedure for the removal of the existing Generators and the one-piece installation of the new generator sets. Indicate any temporary shoring, location of all lifting devices (their attachment points), the loads upon lifting devices at their anchor points, and the intended removal/replacement route (including location of cuts in Vessel structure).

D. **NOTE:**
Unit weight of each unit is approximately 6500 lbs.

E. Prior to commencing exhaust-piping removal, the Contractor shall sample insulation and gasket material to be affected by the removal and have the samples analyzed for ACM. The Contractor will develop a detailed mitigation plan for all ACM uncovered by sampling. The mitigation plan will detail removal, cleanup, and disposal of ACM and any related debris and scrap, and shall be in accordance with all existing environmental and health regulations. A plan approved by appropriate environmental agency shall be provided to WSF.

F. Note and map the location of all interferences prior to removal of the generators. Remove all necessary interferences and reinstall on completion of work. Protect all areas in the vicinity of hot work. Moved and/or reinstalled interferences will be re-insulated and preserved in same manner as original installation. Modify, reroute, and relocate, in a location designated by the Vessel Staff Chief Engineer, any lights, pipes, alarms, vents, remote operators, hose reels or other equipment that will interfere with the clear opening.

G. Drain and properly dispose of lube oil, fuel, and water from the generator set. Disconnect and hard blank, including gaskets if needed, all connection points to prevent contamination from entering the engine and fluids leaking from it.

H. Sketch the planned shipping accesses and submit the sketches to the WSF Inspector and the USCG Inspector for approval prior to cutting or refer to the access provided for the ship service generators.

I. Clean the entire bilge areas of both Engine Rooms, and maintain cleanliness during the course of the Work.

J. Disconnect all piping, tubing, electrical connections, and off skid instrumentation connections from the existing No. 1 and No. 2 Ship Service Generator sets. Plug all openings in the two (2) removed generator sets using threaded plugs, or bolted blind flanges with gaskets. Disconnect the two (2) generator skids from the ship structure.

K. Remove the existing No. 1 and No. 2 Ship Service Generator sets, and transport to WSF warehouse at TODD Shipyard, Harbor Island, Seattle WA. Notify the WSF Representative 48 hours prior to the delivery time. Off load handling will be provided at the delivery location.

L. Engines are to be placed on the existing foundations. Clean the existing foundations and thoroughly inspect for damage, deformation or cracking. Prime and repaint the disturbed foundation areas to match the surrounding structure. Provide new Grade eight (8) forged steel mounting bolts.

M. Install the Generator sets assembled on the skids as one-piece unit on to the existing foundations. Replace the existing vibration isolators (cut & stacked segments of neoprene material) in kind for new Generator Set installation. Do not tilt the Generator Set more than 30 degrees during loading. After all Ship Service Generator Set connections are complete (including the engine exhaust system) and jacket water and WSF furnished lubricating oil are at proper operating levels, the Contractor shall adjust the isolators in accordance with the manufacturer's instructions.

N. Modify, fabricate, and install service piping as necessary to connect to the overhauled Engines. New piping shall be hydrostatically tested to one and one half times (150%) maximum allowable working pressure (MAWP) for each system. Fresh water systems shall be flushed with fresh water until no sediment is observed in a white muslin bag with magnet inside bag.

O. Thoroughly clean and flush the lube oil and fuel oil piping systems of the two (2) new diesels engines. Fuel and lube oil systems shall be flushed from the nearest storage or day tank to the engine connection. Bypass the pumps and piping components that might be damaged or plugged by debris during the flushing. The lube oil and fuel system piping shall be flushed by continuously circulating hot system lube oil (temperature maintained between 130°F - 140°F), the fuel oil system using fuel oil at ambient temperature, at a velocity of at least six (6) feet per second through a temporary ten (10) micron filter and strainer system fitted with white muslin bags with magnets inside bag until filters, muslin bags and magnets remain clean for two (2) consecutive two (2) hour runs at full flow operation. Flushing shall be accomplished utilizing pumping devices that do not form a part of any piping system permanently installed in the Vessel. Pipes shall be vibrated and rattled during the flushing activities to break loose and move debris.

P. Modify existing No. 1 and No. 2 Ship Service Diesel Generator sets exhaust piping and install new hangers as necessary to fit the new installation.

Q. Insulate the existing and modified exhaust piping with removable blankets shall consist of the following: Materials containing asbestos shall not be used.

1. Jacketing 304 SS wire mesh.
2. Barrier Silicon impregnated 16-oz fiberglass cloth.
3. Insulation 3" needled type E type fiberglass or ceramic fiber mat.
4. Liner 304 SS wire mesh or SS foil.
5. Securing 304 SS lacing hooks and wire.
6. Seam fasteners Hog ring staples and Teflon coated SS thread.

R. All the necessary accessories, alarms, excitation systems and automatic features shall function, as a unit and the installation shall be complete in every respect. Except as otherwise required, existing wiring may be reused if and only if it matches the requirements of the new system and if the existing wiring is undamaged. All reused cabling shall be tested in accordance with **VOL II** WSF 002, General Construction Requirements, Cables to be Reused, to the satisfaction of the USCG Inspectors.

S. Testing:

1. Test the overhauled diesel generator set installations to the satisfaction of the USCG Inspector, the Vessel Staff Chief Engineer, and the WSF Inspector. All aspects of switchboard and generator functionality shall be demonstrated including but not limited to emergency shut down, alarms, safety devices, and integration with existing Vessel systems. Load tests shall be two (2) hours long per Diesel generator. The two (2) overhauled diesel generator sets will each be tested using a Contractor provided resistive load box when demonstrating power output.

2. The Contractor is to provide the services of a Factory Representative for verification of start up and testing. The Factory Representative will be present at light off and during load testing. The Contractor shall provide a minimum of two weeks notice prior to initial light off to the WSF Inspector. Testing of the diesel-alternator sets shall demonstrate, at a minimum, the following:

   a. Satisfactory operation of the unit with the alternator at its rated RPM and 100 percent of rated load for four (4) hours, followed by 110 percent rated load for two (2) hours. The Contractor shall provide the load bank for this test. Load testing will utilize Contractor provided lugs at the back of the switchboard.

   b. Proper operation of the start and stop controls both at the unit and at the remote stations.

   c. Proper operation of speed control both at the unit and at the remote stations.

   d. Normal operation of all meters, gages, and alarms.

   e. Proper temperatures and pressure are maintained during the load test.

   f. Proper functioning of all safety, shutdown, and start devices.

   g. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices. WSF will provide

an engine crew in support of generator testing and check out during load tests and dock trials.

NOTE:
For bidding purposes assume two (2) days resistive load bank services will be required. This Item will be adjusted upwards or downwards to account for the actual days required by the Factory Technical Representatives.

T. LOAD BANK REQUIREMENTS

1. The Contractor shall provide a reactive load bank with all operators, cables and ancillary equipment required. The KVA capacity of the load bank shall be, at a minimum, 110% of the combined load with two (2) new Ship Service Diesel Generator sets on-line (in parallel), and be compatible with the new system installed by the Contractor.

2. The load bank and operator shall be on site for system start-up, grooming, and balancing. The load bank shall be installed on the pier (not onboard the Vessel) with leads of appropriate length provided and installed between the load bank and the Vessel's generator load.

U. Prepare all areas of new installation and damaged paint affected by this item, to SSPC-SP 3, Power Tool Cleaning. Provide labor, material and equipment to coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Hand stripes all edges using INTERNATIONAL, Intertuf 262 a minimum of 5 mils (DFT). Apply a minimum of 2 mils, to (DFT), to cover, INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

V. Accomplish an infrared survey by a certified infrared thermographer of all switchboard internal components and connecting circuits, under full load. Provide three (3) copies of a report of conditions found to the WSF Inspector.

5. REPLACE VITAL SERVICE DIESEL GENERATOR [PROPULSION SYSTEM]

A. GENERAL:

1. The Work Item describes the replacement of the one (1) Vital Service Generator.

2. The replacement of the Vital Service Generator shall be accomplished in accordance with this Specification.

3. Disconnect all services and remove the Vital Service Generator set, and replace it with a new, WSF furnished Vital Service Generator set. Install the . The Contractor will pick up the generator at the WSF Eagle Harbor facility. The new Vital Service Generator set is

in-kind to the existing.

NOTE:
All welding qualifications, procedures, and certifications shall meet the requirements for welding as set forth in Attachment Nos. 2, WSF 002 Electrical Installation Specification and Attachment Nos. 3, WSF General Construction Requirements.

B. Develop and submit to the WSF Inspector for approval a detailed written plan outlining the procedure for the removal of the existing Generators and the one-piece installation of the new generator sets. Indicate any temporary shoring, location of all lifting devices (their attachment points), the loads upon lifting devices at their anchor points, and the intended removal/replacement route (including location of cuts in Vessel structure).

C. **NOTE:** Unit weight of each unit is approximately 4800 lbs.

D. Prior to commencing exhaust-piping removal, the Contractor shall sample insulation and gasket material to be affected by the removal and have the samples analyzed for ACM. The Contractor will develop a detailed mitigation plan for all ACM uncovered by sampling. The mitigation plan will detail removal, cleanup, and disposal of ACM and any related debris and scrap, and shall be in accordance with all existing environmental and health regulations. A plan approved by appropriate environmental agency shall be provided to WSF.

E. Note and map the location of all interferences prior to removal of the generators. Remove all necessary interferences and reinstall on completion of work. Protect all areas in the vicinity of hot work. Moved and/or reinstalled interferences will be re-insulated and preserved in same manner as original installation. Modify, reroute, and relocate, in a location designated by the Vessel Staff Chief Engineer, any lights, pipes, alarms, vents, remote operators, hose reels or other equipment that will interfere with the clear opening.

F. Drain and properly dispose of lube oil, fuel, and water from the generator set. Disconnect and hard blank, including gaskets if needed, all connection points to prevent contamination from entering the engine and fluids leaking from it.

G. Sketch the planned shipping accesses and submit the sketches to the WSF Inspector and the USCG Inspector for approval prior to cutting or refer to the access provided for the ship service generators.

H. Clean the entire bilge areas of both Engine Rooms, and maintain cleanliness during the course of the Work.

1. Disconnect all piping, tubing, electrical connections, and off skid instrumentation connections from the existing Vital Service Generator set. Plug all openings in the Vital Service Generator set using threaded plugs, or bolted blind flanges with gaskets.

Disconnect the Vital Service Generator skid from the ship structure.

2. Remove the existing Vital Service Generator set, and transport to WSF warehouse at TODD Shipyard, Harbor Island, Seattle, WA. Notify the WSF Representative 48 hours prior to the delivery time. Off load handling will be provided at the delivery location.

I. Engine is to be placed on the existing foundations. Clean the existing foundation and thoroughly inspect for damage, deformation or cracking. Prime and repaint the disturbed foundation areas to match the surrounding structure. Provide new Grade 8 forged steel mounting bolts.

J. Install the Generator set assembled on the skids as one-piece unit on to the existing foundations. Replace the existing vibration isolators (cut & stacked segments of neoprene material) in kind for new Generator Set installation. Do not tilt the Generator Set more than 30 degrees during loading. After all Vital Service Generator Set connections are complete (including the engine exhaust system) and jacket water and WSF furnished lubricating oil are at proper operating levels, the Contractor shall adjust the isolators in accordance with the manufacturer's instructions.

K. Modify, fabricate, and install service piping as necessary to connect to the overhauled Engines. New piping shall be hydrostatically tested to one and one half times (150%) maximum allowable working pressure (MAWP) for each system. Fresh water systems shall be flushed with fresh water until no sediment is observed in a white muslin bag with magnet inside bag.

1. Thoroughly clean and flush the lube oil and fuel oil piping systems of the Vital Service Generator set. Fuel and lube oil systems shall be flushed from the nearest storage or day tank to the engine connection. Bypass the pumps and piping components that might be damaged or plugged by debris during the flushing. The lube oil and fuel system piping shall be flushed by continuously circulating hot system lube oil (temperature maintained between 130°F - 140°F), the fuel oil system using fuel oil at ambient temperature, at a velocity of at least six (6) feet per second through a temporary ten (10) micron filter and strainer system fitted with white muslin bags with magnets inside bag until filters, muslin bags and magnets remain clean for two (2) consecutive two (2) hour runs at full flow operation. Flushing shall be accomplished utilizing pumping devices that do not form a part of any piping system permanently installed in the Vessel. Pipes shall be vibrated and rattled during the flushing activities to break loose and move debris.

2. Modify existing Vital Service Generator set exhaust piping and install new hangers as necessary to fit the new installation.

L. Insulate the existing and modified exhaust piping with removable blankets shall consist of the following:

1. Materials containing asbestos shall not be used.
2. Jacketing 304 SS wire mesh.
3. Barrier Silicon impregnated 16-oz fiberglass cloth.
4. Insulation 3" needled type E type fiberglass or ceramic fiber mat
5. Liner 304 SS wire mesh or SS foil.
6. Securing 304 SS lacing hooks and wire.
7. Seam fasteners Hog ring staples and Teflon coated SS thread.

M. All the necessary accessories, alarms, excitation systems and automatic features shall function, as a unit and the installation shall be complete in every respect. Except as otherwise required, existing wiring may be reused if and only if it matches the requirements of the new system and if the existing wiring is undamaged. All reused cabling shall be tested in accordance with **VOL II, Attachment No. 2 WSF 002 Electrical** Installation Specification, and Cables to be reused, to the satisfaction of the USCG Inspectors.

N. Testing:

1. Test the overhauled diesel generator set installations to the satisfaction of the USCG Inspector, the Vessel Staff Chief Engineer, and the WSF Inspector. All aspects of switchboard and generator functionality shall be demonstrated including but not limited to emergency shut down, alarms, safety devices, and integration with existing Vessel systems. Load tests shall be two (2) hours long per Diesel generator. The two (2) overhauled diesel generator sets will each be tested using a Contractor provided resistive load box when demonstrating power output.
2. The Contractor is to provide the services of a Factory Representative for verification of start up and testing. The Factory Representative will be present at light off and during load testing. The Contractor shall provide a minimum of two (2) weeks notice prior to initial light off to the WSF Inspector. Testing of the diesel-alternator sets shall demonstrate, at a minimum, the following:
    a. Satisfactory operation of the unit with the alternator at its rated RPM and 100 percent of rated load for four (4) hours, followed by 110 percent rated load for two (2) hours. The Contractor shall provide the load bank for this test. Load testing will utilize Contractor provided lugs at the back of the switchboard.

b. Proper operation of the start and stop controls both at the unit and at the remote stations.

c. Proper operation of speed control both at the unit and at the remote stations.

d. Normal operation of all meters, gages, and alarms.

e. Proper temperatures and pressure are maintained during the load test.

f. Proper functioning of all safety, shutdown, and start devices.

g. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices. WSF will provide an engine crew in support of generator testing and check out during load tests and dock trials.

NOTE:
For bidding purposes assume one (1) day resistive load bank services will be required. This Item will be adjusted upwards or downwards to account for the actual days required by the Factory Technical Representatives.

O. LOAD BANK REQUIREMENTS

1. The Contractor shall provide a reactive load bank with all operators, cables and ancillary equipment required. The KVA capacity of the load bank shall be, at a minimum, 110% of the load with Vital Service Generator, and be compatible with the new system installed by the Contractor.

3. The load bank and operator shall be on site for system start-up, grooming, and balancing. The load bank shall be installed on the pier (not onboard the Vessel) with leads of appropriate length provided and installed between the load bank and the Vessel's generator load.

P. Prepare all areas of new installation and damaged paint affected by this item, to SSPC-SP 3, Power Tool Cleaning. Provide labor, material and equipment to coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Hand stripes all edges using INTERNATIONAL, Intertuf 262 a minimum of 5 mils (DFT). Apply a minimum of 2 mils, to (DFT), to cover, INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

Q. Accomplish an infrared survey by a certified infrared thermographer of all switchboard internal components and connecting circuits, under full load. Provide three (3) copies of a report of conditions found to the WSF Inspector.

6. WATERTIGHT DOOR ROLLER MODIFICATIONS
[MAINTENANCE /WATERTIGHT DOORS]

A. General:

1. The Work Item describes the roller modification of the two (2) sliding watertight doors between the engine rooms and the Engine Control Room.

2. The roller modification of the two (2) sliding watertight doors shall be accomplished in accordance with this Specification and the following drawing:

   VOL II WSF Dwg. 8201-652-004-02 M.V. HYAK, Watertight Door Roller Modifications.

B. Modify the existing watertight doors between the Engine Control Room and each engine room (2 doors total) as shown on **VOL II** WSF Dwg 8201-652-004-02 for installation of new door rollers.

C. Prepare all areas of new installation and damaged paint affected by this item, to SSPC-SP 3, Power Tool Cleaning. Provide labor, material and equipment to coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Hand stripes all edges using INTERNATIONAL, Intertuf 262 a minimum of 5 mils (DFT). Apply a minimum of 2 mils, to (DFT), to cover, INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

D. Prove proper operation to the WSF and US Coast Guard Inspectors.

7. STEERING SYSTEM HYDRAULIC PIPING UPGRADE
[MAINTENANCE /STEERING SYSTEMS]

A. General:

1. The Work Item describes the upgrade of the Steering System hydraulic piping system upgrade to the No. 1 and No. 2 steering gear to allow for 1850 PSI maximum operating pressure and 2000 PSI cross relief pressure.

2. The upgrade to the steering system shall be accomplished in accordance with this specification and the following drawing:

   VOL II WSF Dwg. 8201-632-081-01 M.V. HYAK, Steering System Modifications.

B. Remove and properly dispose of all fluids in both steering systems. Open and clean tanks to the satisfaction of the Staff Chief Engineer. Reinstall covers using new gaskets.

C. Remove the two (2) cylinder cross relief valves from each system and send to the manufacturers authorized repair shop to be set and bench tested at 2000 PSI. Provide certification to the WSF Inspector as to the setting.

D. Reinstall the cylinder cross relief valves using new gaskets and o-rings.

E. Renew all hydraulic hoses fittings and piping as shown on **VOL II** WSF Dwg. 8201-632-081-01.

F. Thoroughly clean and flush the entire hydraulic piping systems serving the steering systems. Hydraulic systems shall be flushed from manifold block to the ram connections. Bypass the pumps and piping components that might be damaged or plugged by debris during the flushing. The system piping shall be flushed by continuously circulating hot system hydraulic oil (temperature maintained between 130-140°F) at a velocity of at least six-feet per second through a temporary ten (10) micron filters. Final cleanness criteria shall be NAC 8. Flushing shall be accomplished utilizing pumping devices that do not form a part of any piping system permanently installed in the Vessel. Pipes shall be vibrated and rattled during the flushing to break loose debris.

G. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP 3, Power Tool Cleaning. Provide labor, material and equipment to coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Hand stripes all edges using INTERNATIONAL, Intertuf 262 a minimum of 5 mils (DFT). Apply a minimum of 2 mils, to (DFT), to cover, INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

H. Prove proper operation to the US Coast Guard.

8. PILOT HOUSE STEERING HANDLE REPLACEMENT
[MAINTENANCE /STEERING SYSTEMS]

A. General

1. The Work Item describes the replacement of the steering handles in the No. 1 & No. 2 Pilothouses.

B. Provide the service of Matthews Marine Systems Inc of Portland Oregon to provide and install the WSF Matthews Marine Systems steering handles in the No. 1 and No. 2 Pilothouses.

C. Prove proper operation to the US Coast Guard.

9. AMS INSTALLATION
[PROPULSION SYSTEM]

A. GENERAL:

1. The Work Item describes the installation of a WSF furnished Alarm and Monitoring System (AMS) located in the EOS, and installation, relocation or replacement of other electrical components in the EOS, Engine room, and elsewhere on the Vessel.

2. The renewal of the Alarm and Monitoring System shall be accomplished in accordance with this specification and the following drawings:

VOL II WSF Dwg. No. 8201-652-090-1 M.V. HYAK, Electrical One-Line Diagram

VOL II WSF Dwg. No. 8201-652-090-2 M.V. HYAK, Electrical One-Line Diagram Rip Out

VOL II WSF Dwg. No. 8201-652-090-5 M.V. HYAK, Pilothouse 24 VDC Distribution System Modification One-Line Diagram

VOL II WSF Dwg. No. 8201X-590-094-01 M.V. HYAK, Steering System Control and RAI Elem & ISO Wiring

VOL II WSF Dwg. No. 8201-652-095-08 M.V. HYAK, Emergency Diesel Engine Alarm & Monitoring Rip Out

VOL II WSF Dwg. No. 8201-652-095-09 M.V. HYAK, High Bilge Level Alarm System Elem. W.D.

VOL II WSF Dwg. No. 8201-652-099-01 M.V. HYAK, Alarm & Monitoring System Supper Class Ferry

VOL II WSF Dwg. 8201-652-099-02 M.V. HYAK, Alarm & Monitoring System Signal List

VOL II WSF Dwg. No. 8201-652-099-03 M.V. HYAK, EOS Console Modifications

VOL II WSF Dwg. No. 8201-652-099-04 M.V. HYAK, Main Diesel Gauge Board and I/O Panel

VOL II WSF Dwg. No. 8201-652-099-10 M.V. HYAK, AMS System Arrangement

B. The Contractor in his planning shall consider that the Washington State Ferries (WSF) furnished components will be delivered to the shipyard not later than one (1) month after the arrival of the Vessel.

C. Remove the existing Alarm and Monitoring System and replace them with the new, WSF Furnished as shown in **VOL II** WSF Dwg. 8102-652-099-01, **VOL II** WSF Dwg. No. 8102-652-099-02, **VOL II** WSF Dwg. No. 8102-652-099-04, and **VOL II** WSF Dwg. No. 8102-652-099-10.

D. The installation of the new AMS should be coordinated with the installation of the new MCC Control Cubicle in the EOS addressed in Work Items MOTOR CONTROL CENTERS.

E. Note and map the location of all interferences prior to removals. Remove all necessary interferences and reinstall on completion of work. Protect all areas in the vicinity of hot work. Moved and/or reinstalled interferences will be re-insulated and preserved in same manner as original installation. Modify, reroute, and relocate, in a location designated by the Vessel Staff Chief Engineer, any lights, pipes, alarms, vents, remote operators, or other equipment that will interfere with the clear opening. Mounting the new gauge and Main Engine I/O panels will require the relocation of cable and cable hangers, tubing bundle and the Treatment Tank sight glass and piping on the stanchions in the engine rooms. See **Vol. II** WSF Dwg 8210-652-099-04. Fabricate foundation and mount new gauge and I/O panels as indicated. Anti-vibration cross supports, anti-sway bracing and vibration isolators shall be installed to minimize engine vibration affecting the panels. Such bracing may connect to jacket water piping flanges as done with removed panels.

F. Remove the existing sensors being replaced with new as shown on **Vol. II** WSF Dwg 8210-652-099-01 from the main engines and generators.

G. Fabricate mounts and install the WSF furnished, ET200 Panels in locations designated as shown on **Vol. II** WSF Dwg 8210-652-099-04 and **Vol. II** WSF Dwg 8210-652-099-10. In the No. 1 Engine Room, locate the Aux No. 1 Remote I/O ET-200 panel at the location of the removed No. 1 Lift Tank Controllers. In the No. 2 Engine Room, locate the Aux No .2 RIO Panel on that portion of the Potable Water tank facing Main Engine No. 3. Both motor room RIO Panels will mount above and ahead of thrust bearing lube oil pumps on the void bulkheads.

H. Shipyard shall coordinate with AMS system vendor's work of installing the new panel and otherwise modifying the EOS Console as shown on **VOL II**, WSF Dwg. 8210-652-099-03. Such coordination shall including rip outs, installing new cables, installing new ventilation modifications, and related shipyard responsibilities with the EOS console work of the AMS systems vendor.

I. Provide and pull all interconnecting cabling to and between new equipment as shown in **VOL II** WSF Dwg. No. 8201-652-090-01, **VOL II** WSF Dwg. No. 8201X-590-094-01, **VOL II** WSF Dwg. No. 8201-652-090-5, **VOL II** WSF Dwg. No. 8201-652-095-09, **VOL II** WSF Dwg. No. 8102-652-099-01, **VOL II** WSF Dwg. 8102-652-099-02, **VOL II** WSF Dwg. No. 8201-652-099-03, **VOL II** WSF Dwg. No. 8201-652-099-04, **VOL II** WSF Dwg. No. 8102-652-099-05, **VOL II** WSF Dwg. No. 8102-652-099-06, and **VOL II** WSF Dwg. No. 8201-652-099-10. The Work includes all new and modified cableways and hangers.

J. Install new multi cable transits as necessary in location designated by the WSF Inspector.

NOTE:
For Bidding purposes assume 10 each 8x1 RTS Transits including all necessary packing.

K. Megger test and continuity check all new and reused cable associated with Work under this Contract.

L. Interconnecting cable designate for reuse may be extended through the use of an ABS splice kit or approved junction box. All such cases shall be presented to the WSF Inspector for final approval, in writing, prior to extending the cable. In these cases, the reused portion of the cable shall be meggered to prove it is good.

M. Install sway bracing with vibration dampening couplings from the enclosure tops to main structure.

N. Remove the existing four (4) Woodard PGA governors from the engines as category A box the governors up for protection and turn over to the Staff Chief Engineer.

O. Install all, WSF provided, sensors as shown on **VOL II** WSF Dwg. No 8201-652-099-01, and **VOL II** WSF Dwg. No 8201-652-099-02.

P. Install new sensor pipe and tubing to connect all enclosures to equipment sensors as located on **VOL II** WSF Dwg. No 8201-652-099-01, **VOL II** WSF Dwg. No 8201-652-099-02 and **VOL II** WSF Dwg. No 8201-652-099-04. Install new isolation valves on all tubing runs prior to connecting the new gauge panels. All instrumentation piping/tubing systems shall be installed straight and true and in accordance with the requirements of this Technical Specification and **VOL II, Attachment No. 3, WSF 003, General Construction Requirements**. The location of the piping and sensors shall be coordinated to clear openings, structural members, and other existing piping. Horizontal and vertical offsets with pipefittings shall be made to install the system in the space available. Pipe hangers shall be Parker Multi-Clamp, or Owner approved equal.

Q. Before installation of the piping and sensors in any part of the system, the piping and fittings shall be cleaned inside and made free of oil, dirt, and foreign matter. Screw joints and fittings shall conform to ANSI. Parker Bite-Type fittings shall be used on stainless tubing and products manufactured by either Parker shall be used elsewhere. All connections shall be free of cuttings and burrs and shall have a maximum of three (3) exposed threads. Lubricants and sealing compounds shall be applied to male threads prior to makeup.

R. All flexible hose shall be USCG approved, Aeroquip, or Owner approved equal, suitable for the application. **VOL II Attachment No. 3, WSF 003 General Construction Requirements**.

S. Test all new pipe and tubing installations. All piping tests shall be performed prior to concealment or covering. All systems shall remain under test for a sufficient length of time to prove tightness and systems integrity and for adequate observation by the WSF Representative (a minimum of ten (10) minutes). An acceptable test shall indicate no leakage.

T. Air pressure circuit piping shall be pneumatically tested with air to 150% MAWP. Joints shall be soap bubble tested. Fuel oil or any instrument piping, which shall carry hydrocarbons, shall be tested with 150% MAWP (PSIG) with dry nitrogen.

U. Piping systems modified by the installation of sensors shall be flushed until temporary filters installed in the system are free from visible contaminants. Flushing shall be carried out a minimum of four (4) hours. A procedure for flushing shall be developed by the Contractor and submitted for approval to the WSF prior to the testing.

ATTENTION:

WSF supplied Technical Representative requires fifteen (15) working days, from the time when the completely installed equipment and cables are turned over to WSF as a system. The motor rooms, remote Aux 1 and Aux 2 panels, and I/O panels are to be turned over for cable termination by 30 days prior to dock trials to allow the WSF supplied Technical Representative to begin the terminal hook-up of the AMS and system grooming. The WSF Technical Representative will terminate all cables inside the cabinets described in paragraph K and elsewhere in these Specifications. The Contractor shall be responsible for all terminations other than the cabinets, all continuity checks, cable penetrations, floaters, and cable tags. The Contractor shall take this fifteen (15) working day time frame into consideration when planning removals, equipment installation, cable installation, set up, and testing of the new AMS system.

V. All electrical enclosures and/or equipment manufactured for electrically conductive material shall be electrically bonded (grounded) to the Vessel structure as follows:

1. Bonding shall be achieved through the method of mounting equipment, or by use of flexible copper cable or strap. Either method shall form a positive ground connection from the enclosure to the Vessel structure.

2. Bonding cables shall be installed using minimum length of cable and be consistent with, and meet Regulatory Agency requirements.

3. All bonded cables shall be installed in locations that provide minimum exposure to possible physical damage and provide inspection, repair and replacement access.

4. Bonding cables shall be attached to Vessel structure by a dedicated weld stud or weld pad and shall not be attached to pipe hangers, wire ways, mounting hardware, or attachments.

5. Bonded equipment shall include, but is not limited to, switchboards,. transformers, electronics cabinets, battery chargers, transfer switches, lighting fixtures, and receptacles. Electrical devices isolated by nonconductive bushings, boots, vibration isolators, and dampers shall also be bonded (grounded) to the hull. All new equipment capable of generating static discharges shall also be bonded to the hull.

W. Provide assistance to WSF supplied Technical Representatives to assist with system grooming and wiring checks.

NOTE:
For bidding purposes assume 100 hours will be required. This Item will be adjusted upwards or downwards to account for the actual labor hours required.

X. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP 3, Power Tool Cleaning. Coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Use INTERNATIONAL, Intertuf 262 a minimum of 5 mils (DFT) on all edges. Apply a minimum of 2 mils (DFT), of INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

Y. Replace all disturbed structural, thermal, and acoustical insulation with none ACM material providing insulating value as originally installed.

Z. Repair all disturbed deck filler and coverings to match existing system. New deck repairs shall provide a continuous surface to suit and abut all new equipment locations. The Contractor shall match the existing color and design of the floor covering to the greatest extent possible. The existing tile is Armstrong Imperial Texture Standard Excelon Vinyl composition tile, 12” x 12” x 1/8”. The Contractor shall provide samples of the new deck covering to the WSF Inspector for approval prior to ordering.

AA. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices. WSF will provide an engineering operating crew in support of running generators for this testing and for check out during load tests and dock trials.

10. FAN MOTOR CONTROL CENTER (MCC) INSTALLATIONS [PROPULSION SYSTEM]

ASBESTOS WARNING

Existing deck tile, underlayment, and joiner panels contain asbestos of varying amounts. Tile, underlayment, and joiner panel removals shall be accomplished by licensed personnel in accordance with current Federal, Local and State environmental regulations. Removed materials shall be disposed of in accordance with current Federal, Local and State regulations.

A. GENERAL:

1. The Work Item describes the installation of WSF furnished Fan Motor Control Centers (MCC) 2 thru 5 and their corresponding MCC Control Cubicle located in EOS. Install the **Owner Furnished Materials**. The Contractor shall pick up the motor control centers at the WSF warehouse on 6th Ave.

2. The renewal of the Motor Control Centers (MCC) 2 thru 5. shall be accomplished in accordance with this specification and the following drawings:

   VOL II WSF Dwg. No. 8201-652-090-01 M.V. HYAK, Electrical One-Line Diagram

   VOL II WSF Dwg. No. 8201-652-090-02 M.V. HYAK, Electrical One-Line Diagram Rip out

   VOL II WSF Dwg. No. 8201-652-099-30 M.V. HYAK, Motor Control Centers 2 through 5

   VOL II WSF Dwg. No. 8201-652-099-10 M.V. HYAK, AMS System Arrangement

B. Remove the existing MCC's and replace them with new, WSF Furnished as shown in **VOL II** WSF Dwg. No. 8201-652-090-01, **VOL II** WSF Dwg. No. 8201-652-090-02 and **VOL II** WSF Dwg. No. 8201-652-099-30.

C. The installation of the new MCC Control Cubicle shall be coordinated with the installation of the new AMS Cubicle in the EOS. The MCC Cubicle shall be furnished with the AMS Cubicle. The joiner bulkhead and doorway interferences shall be removed as necessary to allow new installations. The AMS and MCC Cubicles shall be installed in the location as shown on **VOL II** WSF Dwg. No. 8201-652-099-10. Before installation, Contract shall drain, clean, and certify any and all tanks affected by the installation gas-free. Obtain a Marine Chemist Certificate for "SAFE FOR WORKERS, SAFE FOR HOT WORK". Maintain the certificate during the course of the work. Build and install foundations to suit the new Cubicles, with 4-inch toe-kicks, and mount the cubicle side by side adjacent to the existing switchboard. Cubicles shall be installed to avoid any interference with the door swings and internal access. Cubicle shall be braced at the top with appropriate sway-bracing and vibration isolators.

D. Note and map the location of all interferences prior to removal of the MCC's. Remove all necessary interferences and reinstall on completion of work. Protect all areas in the vicinity of hot work. Moved and/or reinstalled interferences will be re-insulated and preserved in same manner as original installation.

E. Disconnect all ship's wiring from the existing MCC's and other components to be replaced or relocated including the power panels shown on **VOL II** WSF Dwg. No. 8201-652-090-1**.** Carefully document all connections. Protect cables from damage during the removal and installation of the new MCC's. All cables found with cracked or damaged insulation shall be replaced back to the next junction box. Reconnect all cabling to be retained and test for proper operation. Contract shall replace all remote handstation pilot lights from 480 VAC type to 24 VDC operator's that fit into the existing handstation boxes.

F. Modify the existing foundations to land the new MCC's.

G. Megger test and continuity check all new and reused cable associated with Work under this Contract provide the results to the WSF Inspector.

NOTE:
All cabling requirements, procedures, and installation shall meet the requirements for cabling as set forth in Work Item 5 and Attachment No. 2, WSF 002 Electrical Installation Specification.

H. Install fiber optic cable from the MCC Control Cubicle in a ring configuration to MCC's 2 thru 5 for termination in the ET200M's as shown on **VOL II** WSF Dwg. No. 8201-652-099-01.

I. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP 3, Power Tool Cleaning. Coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Use INTERNATIONAL, Intertuf 262 to a minimum of 5 mils (DFT) on all edges. Apply a minimum of 2 mils, (DFT), of INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

J. Replace all disturbed structural, thermal, and acoustical insulation to match original installation.

K. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices.

L. The installation/operational testing of the MCC's shall include, but not be limited to, the following:

1. Verify that the MCC installation hook-up is in accordance with the Technical Specifications and drawings.

2. Check bonding (grounding) of cubicles and components of cubicles.

3. Check availability and marking of components in accordance with the relevant drawings.

4. Verify the wire size and wire markers of all installed wires and cables.

11. MOTOR CONTROL PANEL UPGRADES
[MAINTENANCE]

A. General

1. The Work Item describes the installation of 16 (sixteen) Contractor furnished motor control panels throughout the engine space.

2. The renewal of these motor control panels shall be accomplished in accordance with this Specification and the following drawings:

VOL II WSF Dwg. No. 8201-652-090-1 M.V. HYAK, Electrical One-Line Diagram

VOL II WSF Dwg. No. 8201-652-090-2 M.V. HYAK, Electrical One-Line Diagram Rip out

VOL II WSF Dwg. No. 8201-652-091-01 M.V. HYAK, Motor Control Wiring Diagram

VOL II WSF Dwg. No. 8201-652-099-03 M.V. HYAK, EOS Console Modifications

B. Remove the existing motor control panels and replace them with new.

C. Note and map the location of all interferences prior to removal of the power panels. Remove all necessary interferences and reinstall on completion of work. Protect all areas in the vicinity of hot work. Moved and/or reinstalled interferences will be re-insulated and preserved in same manner as original installation.

D. Disconnect all ship's wiring from the existing motor control panels shown on **VOL II** WSF Dwg. No. 8201-652-090-1. Carefully document all connections.

E. Protect cables from damage during the removal and installation of the new Power Panels. Reconnect all cabling to be retained and test for proper operation.

F. Modify the existing foundations to land the new motor control Panels.

G. Existing cables may be reused if they are long enough. Should a existing cable not be long enough it shall be replace in its entirety from the panel to the first junction box or piece of equipment.

H. Megger test and continuity check all new and reused cable associated with Work under this Contract provide the results to the WSF Inspector.

NOTE:
All cabling requirements, procedures, and installation shall meet the requirements for cabling as set forth in Attachment WSF 002 of this Specification.

I. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP 3, Power Tool Cleaning. Coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Use INTERNATIONAL, Intertuf 262 to a minimum of 5 mils (DFT) on all edges. Apply a minimum of 2 mils, (DFT), of INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

J. Replace all disturbed structural, thermal, and acoustical insulation to match original installation.

K. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices.

L. The installation/operational testing of the motor control Panels shall include, but not be limited to, the following:

1. Verify that the motor control panel installation hook-up is in accordance with the Technical Specifications and drawings.

2. Check availability and marking of components in accordance with the relevant drawings.

3. Verify the wire size and wire markers of all installed wires and cables.

12. BILGE PAINTING
[PROPULSION SYSTEM]

A. Coordinate the bilge painting with engine room removals and Oily water seperator Holding Tank Installation.

B. Areas to be preserved:

1. In each engine room; the area from the deck plate level and below from Frame 6 to Frame 26 including all piping, structure and foundations including the tops of beams and deck plate structure.

C. The areas to be preserved in the engine rooms shall be treated by preparation and painting using the following system:

1. Thoroughly degrease and clean the areas to be preserved by a water wash to SSPC-SP 12/NACE 5 Low Pressure Water Cleaning (LP WC) WJ-3 and appropriate cleaning solution.

2. Wash the entire area to be preserved with International GMA following the manufacturers recommendation.

3. Prepare areas of failed coating to SSPC-SP 3 Power Tool Cleaning.

4. Paint SSPC-SP 3 prepared areas with one coat of Ameron Amercoat 235, to obtain minimum 6 mils (DFT) minimum. Hand stripe all edges. Color to be tinted different than existing coating.

5. Paint the entire areas described paragraph “A” with one coat of Ameron Amercoat 235, to obtain minimum 6 mils (DFT) minimum. Color to be tinted to match existing coating.

NOTE:
For bidding purposes assume room 1000 sq ft of failed coating requiring SSPC-SP 3 preparation and coating in each engine room. The Contract Price will be adjusted upwards or downwards to reflect any difference in area of failed coating.

13. SHOREPOWER CIRCUIT BREAKER RENEWAL
[PROPULSION SYSTEM]

A. GENERAL:

1. The Work Item describes the renewal of the Shore power Circuit Breaker and modification of electrical system.

2. The renewal of the Shore power Circuit Breaker and modification of electrical system, shall be accomplished in accordance with this specification and the following drawings:

VOL II Dwg 8201-652-090-01 M/V HYAK, Electrical One-Line Diagram

VOL II Dwg 8201-652-090-02 M/V HYAK, Electrical One-Line Diagram Rip Out

B. The shore power circuit breaker shall be replaced with a new breaker as shown on **VOL II** WSF DWG 8201-652-090-01, and **VOL II** WSF DWG 8201-652-090-02.

C. The circuit breaker shall be adjusted to comply with 46 CFR 111.12-11. After installation and calibration, a permanent label plate shall be affixed to the circuit breaker listing all of the settings.

D. The bussing in the switchboard shall be modified as necessary to fit the new breaker.

E. The switchboard front shall be modified as necessary to fit the new breaker.

14. TEMPORARY EMERGENCY POWER ABT REPLACEMENT
[PROPULSION SYSTEM]

A. GENERAL:

1. The Work Item describes the renewal of the Temporary Emergency Power (TEP) Automatic Bus Tie (ABT) and modification of electrical system.

2. The renewal of the TEP ABT and modification of electrical system, shall be accomplished in accordance with this specification and the following drawings:

VOL II Dwg 8201-652-090-01 M/V HYAK, Electrical One-Line Diagram

VOL II Dwg 8201-652-090-02 M/V HYAK, Electrical One-Line Diagram Rip Out

B. Remove existing TEP ABT as **Category "D"**.

C. Disconnect all ship's wiring from the existing TEP ABT shown on **VOL II** WSF Dwg. No. 8201-652-090-1. Carefully document all connections.

D. Protect cables from damage during the removal and installation of the new Power Panels. Reconnect all cabling to be retained and test for proper operation.

E. Modify the existing foundations to land the new TEP ABT.

F. Provide and install a new TEP ABT in accordance with **VOL II** Dwg 8201-652-090-01.

G. Install new cables as shown on **VOL II** Dwg 8201-652-090-01.

H. Existing cables may be reused if they are long enough. Should a existing cable not be long enough it shall be replace in its entirety from the panel to the first junction box or piece of equipment.

I. Megger test and continuity check all new and reused cable associated with Work under this Contract provide the results to the WSF Inspector.

NOTE:
All cabling requirements, procedures, and installation shall meet the requirements for cabling as set forth in Attachment No. 2, WSF 002 Electrical Installation Specifications.

J. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP 3, Power Tool Cleaning. Coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Use INTERNATIONAL, Intertuf 262 to a minimum of 5 mils (DFT) on all edges. Apply a minimum of 2 mils, (DFT), of INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

K. Replace all disturbed structural, thermal, and acoustical insulation to match original installation.

L. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices.

M. The installation/operational testing of the ABT shall include, but not be limited to, the following:

1. Verify that the Power Panel installation hook-up is in accordance with the Technical Specifications and drawings.

2. Check availability and marking of components in accordance with the relevant drawings.

3. Verify the wire size and wire markers of all installed wires and cables.

4. Calibrate and test the new installation in accordance with the ABT Manufacturers Instructions.

15. POWER PANEL REPLACEMENT
[PROPULSION SYSTEM]

A. GENERAL:

1. The Work Item describes the replacement of the miscellaneous power panels through the Vessel and modification of electrical system.

2. The replacement of the power panels and modification of electrical system, shall be accomplished in accordance with this Specification and the following drawings:

VOL II Dwg 8201-652-090-01 M/V HYAK, Electrical One-Line Diagram

VOL II Dwg 8201-652-090-02 M/V HYAK, Electrical One-Line Diagram Rip Out

B. The following panels including all breakers shall be replaced as shown on **VOL II** Dwg 8201-652-090-01:

Lighting Load Center NO. P4

Lighting Load Center NO. P5

Lighting Panel LP1

Lighting Panel LP2

Lighting Panel LP3

Lighting Panel LP4

Lighting Panel LP5

Lighting Panel LP6

Lighting Panel LP7

Galley Power Panel NO. GP3 including feeder P3

Galley Power Panel NO. GP2

Power Panel NO. P1

Power Panel NO. P6 including feeder ABT-1 (A)

Power Panel NO. P8

I.C. Panel including feeder P50/1P1/UPS

Emergency Panel EP2

Emergency Panel EP1

Temp Emergency Lighting Panel NO. ELP1

Temp Emergency Lighting Panel NO. ELP2

Temp Emergency Lighting Panel NO. ELP5

Temp Emergency Lighting Load Center ELP.

C. Relocate Power Panel P15 into the No. 1 engine room as shown on **VOL II** Dwg 8201-652-090-01.

D. Remove the existing power panels and replace them with new.

E. Note and map the location of all interferences prior to removal of the power panels. Remove all necessary interferences and reinstall on completion of work. Protect all areas in the vicinity of hot work. Moved and/or reinstalled interferences will be re-insulated and preserved in same manner as original installation.

F. Disconnect all ship's wiring from the existing power panels shown on **VOL II** WSF Dwg. No. 8201-652-090-1. Carefully document all connections.

G. Protect cables from damage during the removal and installation of the new Power Panels. Reconnect all cabling to be retained and test for proper operation.

H. Modify the existing foundations to land the new Power Panels.

I. Existing cables may be reused if they are long enough. Should a existing cable not be long enough it shall be replace in its entirety from the panel to the first junction box or piece of equipment.

J. Megger test and continuity check all new and reused cable associated with Work under this Contract provide the results to the WSF Inspector.

NOTE:
All cabling requirements, procedures, and installation shall meet the requirements for cabling as set forth in Attachment No. 2 of this Specification.

K. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP 3, Power Tool Cleaning. Coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Use INTERNATIONAL, Intertuf 262 to a minimum of 5 mils (DFT) on all edges. Apply a minimum of 2 mils, (DFT), of INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

L. Replace all disturbed structural, thermal, and acoustical insulation to match original installation.

M. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices.

N. The installation/operational testing of the Power Panels shall include, but not be limited to, the following:

1. Verify that the Power Panel installation hook-up is in accordance with the Technical Specifications and drawings.

2. Check availability and marking of components in accordance with the relevant drawings.

3. Verify the wire size and wire markers of all installed wires and cables.

16. 24 VOLT DC POWER SYSTEM MODIFICATIONS [PROPULSION SYSTEM]

A. GENERAL:

1. The Work Item describes the modification of the 24 Volt DC power system.

2. The modification of the 24 Volt DC power system, shall be accomplished in accordance with this specification and the following drawings:

VOL II Dwg 8201-652-090-01 M/V HYAK, Electrical One-Line Diagram

VOL II Dwg 8201-652-090-02 M/V HYAK, Electrical One-Line Diagram Rip Out

B. Remove existing 24 V Ships service battery charger and cables as Category D as shown on **VOL II** Dwg 8201-652-090-02.

C. Relabel the existing 24 VDC Power Panel EP24 to EP24A and relabel all cables shall be as shown on **VOL II** WSF Dwg. No. 8201-652-090-1.

D. Provide and install new Panel EP24 as shown on **VOL II** WSF Dwg. No. 8201-652-090-1.

E. Protect cables from damage during the removal and installation of the new Power Panels. Reconnect all cabling to be retained and test for proper operation.

F. Install new foundations to land the new panel, disconnect switches, battery chargers, power supplies and battery banks.

G. Provide and install new battery chargers, power supplies and disconnect switches in accordance with **VOL II** Dwg 8201-652-090-01.

H. Install new cables as shown on **VOL II** Dwg 8201-652-090-01.

I. Existing cables may be reused if they are long enough. Should an existing cable not be long enough it shall be replace in its entirety from the panel to the first junction box or piece of equipment.

J. Megger test and continuity check all new and reused cable associated with Work under this Contract provide the results to the WSF Inspector.

NOTE:
All cabling requirements, procedures, and installation shall meet the requirements for cabling as set forth in Attachment No. 2 of this Specification.

K. Provide 12” x 12” Louvered vent with screen in center of lower 1/3 of the dumbwaiter door.

L. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP 3, Power Tool Cleaning. Coat all prepared surfaces with INTERNATIONAL, Intertuf 262 a minimum of 6 mils (DFT). Use INTERNATIONAL, Intertuf 262 to a minimum of 5 mils (DFT) on all edges. Apply a minimum of 2 mils, (DFT), of INTERNATIONAL, Intercare 755 finish coat to match surrounding color.

M. Replace all disturbed structural, thermal, and acoustical insulation to match original installation.

N. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices.

O. The installation/operational testing of the 24 VDC system shall include, but not be limited to, the following:

1. Verify that the installation hook-up is in accordance with the Technical Specifications and drawings.

2. Check availability and marking of components in accordance with the relevant drawings.

3. Verify the wire size and wire markers of all installed wires and cables.

4. Calibrate and test the new installation in accordance with the Battery Charger’s Manufacturers Instructions.

5. Calibrate and test the new installation in accordance with the Power Supply’s Manufacturers Instructions.

17. OILY WATER SEPARATOR HOLDING TANK INSTALLATION [PROPULSION SYSTEM/POLLUTION PREVENTION]

A. GENERAL:

1. The Work Item describes the installation of a Oily Water holding Tank and installation and modifications of associated piping connecting to the existing Oily Water Separator. Connection to the existing Oily Water Separator and installation of the Oily Water Holding Tank and associated piping, shall be accomplished in accordance with this Specification and the following drawings:

VOL II WSF Dwg 8201-652-070-01 MV HYAK, Oily Water Separator & Holding Tank Piping Installation

VOL II WSF Dwg 8201-652-078-01 MV HYAK, New Lube Oil

Tanks and Oily Bilge Tank Structural Arrangement and Details

VOL II WSF Dwg 8201-652-090-01 MV HYAK**,** Electrical One – Line Diagram

VOL II WSF Dwg 8201-652-099-01 M/V HYAK, Alarm & Monitoring System

B. Clean and gas free all spaces associated with the Work as necessary, and obtain a Marine Chemist Certificate for "SAFE FOR HOT WORK". Maintain the certificate during the course of the work.

C. Note and map the location of all interferences associated with the bilge and oily water tank installation. Remove all necessary interferences and reinstall on completion of work. Protect all areas in the vicinity of hot work. Moved and/or reinstalled interferences will be re-insulated and preserved in same manner as original installation. Modify, reroute, and relocate, in a location designated by the Vessel Staff Chief Engineer, any lights, pipes, alarms, vents, remote operators, hose reels or other equipment that will interfere with the clear opening.

D. Electrical connection to the existing Oily Water Separator shall be in accordance with **VOL II** Dwg 8201-652-090-01.

E. Connect the new Oily Bilge tank level transmitter to the Alarm & Monitoring System in accordance with **VOL II** Dwg 8201-652-099-01.

F. Fabricate and install new Oily Bilge Tank as shown on **VOL II** WSF Dwg 8201-652-070-01 and **VOL II** WSF Dwg 8201-652-078-01.

G. Provide and install a new GEMS XT-800 level transmitter for the new Oily Bilge Tank in accordance with General Note 11 of **VOL II** Dwg 8201-652-070-01. Calibrate level transmitter following completion of tank installation.

H. Completed tank shall be tested in accordance with **VOL II** WSF Dwg 8201-652-078-01.

I. Blast the interior of the new tank to SSPC SP-6. Coat the interior surfaces of the new Bilge & Oily Water Holding Tank with 2 mils Intergard 268 (EGA888-Red) epoxy primer, followed by 5 mils Intergard 264 (FPL274-Red) epoxy paint.

J. Install new piping and modify the existing piping as shown on **VOL II** WSF Dwg 8201-652-070-01. The existing oily water separator's manufacturers instruction shall be followed.

K. New piping shall be hydrostatically tested to one and one half times (150%) maximum allowable working pressure (MAWP) for each system. The entire system shall be flushed with fresh water until no sediment is observed in a white muslin bag with magnet inside bag.

L. Prepare all disturbed paint surfaces to an SSPC-SP 3, Power Tool Cleaning and apply one (1) coat of International Intertuf 262, Buff, at a minimum of 6 mils (DFT). Apply one (1) final coat of International Intercare 755, of matching color for area, at a minimum of 2 mils (DFT), to cover. Repair all coatings damaged by the Work to match original finish.

18. FUEL OIL FILL AND TRANSFER PIPING MODIFICATION [MAINTENANCE]

A. The Work Item describes the modification of the fuel oil fill and transfer system including the installation of a new main deck fill station. The installation, shall be accomplished in accordance with this Specification and the following drawings:

VOL II WSF Dwg 8201-652-056-01 M/V HYAK, Fuel Oil Fill & Transfer Piping Modification

VOL II WSF Dwg 8201-652-090-01 M/V HYAK, Electrical One-Line Diagram

VOL II WSF Dwg 8201-652-091-01 M/V HYAK, Motor Control Wiring Diagrams

B. Install new piping and modify the existing piping as shown on WSF Dwg 8201-652-056-01.

C. Replace two (2) existing and install two (2) new emergency stop handstations at all four (4) fueling stations. Hand stations shall be Square D Type BR 103. Install new interconnecting armored cable from the two (2) existing fueling stations to the two new stations. Retag existing cables to reflect circuit P6 designation.

D. New piping shall be hydrostatically tested to one and one half times (150%) maximum allowable working pressure (MAWP) for each system. The entire system shall be flushed with the respective system fluid until no sediment is observed in a white muslin bag with magnet inside bag.

E. Install new emergency stop switches for the new and existing fueling stations in accordance with **VOL II** WSF Dwg 8201-652-090-01.

F. Prepare all disturbed paint surfaces to an SSPC-SP 3, Power Tool Cleaning and apply one (1) coat of INTERNATIONAL Intertuf 262, Buff, at a minimum of 6 mils (DFT). Apply one (1) final coat of INTERNATIONAL Intercare 755, of matching color for area, at a minimum of 2 mils (DFT), to cover. Repair all coatings damaged by the Work to match original finish.

19. PASSENGER ELEVATOR INSTALLATION
[NON-LIFE CYCLE]

A. GENERAL:

1. The Work Item describes the installation of the one (1) new, WSF furnished, MacGREGOR KONE Passenger Elevator module on No. 1 End. The installation of the MacGREGOR KONE Passenger Elevator module, shall be accomplished in accordance with this Specification and the following drawings:

VOL II WSF Dwg 8201-652-003-01 M/V HYAK, Structural & Stairway Mods in Way of Elevator Installation Removals

VOL II WSF Dwg 8201-652-003-02 M/V HYAK, Structural & Stairway Mods in Way of Elevator Installation A&D

VOL II WSF Dwg 8201-652-012-03 M/V HYAK, Ventilation Modifications In Way Of Elevator Installation

VOL II WSF Dwg 8201-652-024-01 M/V HYAK, Wayfinding Signage fro New Elevator & Unisex Restroom A&D

VOL II WSF Dwg 8201-652-024-02 M/V HYAK, Priority Parking for Mobility Impaired Passengers and MES Routing Modification

VOL II WSF Dwg 8201-652-078-01 M/V HYAK, New Lube Oil Tanks and Oily Bilge Tank Structural Arrangement and Details

VOL II WSF Dwg 8201-652-092-01 M/V HYAK, Upper Passenger Deck Lighting, ADA Restroom & Elevator Electrical Mods

VOL II WSF Dwg 8201X-509-095-1 M/V HYAK, Public Address System Vehicle Deck Modifications

VOL II WSF Dwg 8201-652-095-05 M/V HYAK, Passenger Elevator Intercom System “3MC” Wiring Diagram

VOL II WSF Dwg 8201-652-099-01 M/V HYAK, Alarm and Monitoring System

VOL II WSF Dwg 8201-652-090-01 M/V HYAK, Electrical One-Line Diagram

VOL II WSF Dwg 8201-652-090-02 M/V HYAK, Electrical One-Line Diagrams Rip Out

VOL II WSF Dwg 8201-652-057-01 M/V HYAK, Piping Installation Arrg’t for New Main and Auxiliary LO Tanks

VOL II MacGregor Dwg. TR21002 Plug in Trunk Structure Super Class

VOL II MacGregor Dwg. H304660 General Arrangement Passenger Elevator

VOL II MacGregor Dwg. H304660-op1 General Arrangement Passenger Elevator

VOL II MacGregor Dwg. 823893E00 Electrical Wiring Diagrams

VOL II MacGregor Dwg. 823896 Interphone System of Elevator

VOL II MacGregor Dwg. Elevator Trunk Installation Instruction

VOL II MacGregor Dwg. IN21002 Insulation Schedule

VOL II MacGregor Dwg. 52900010 Lifting of Elevator

VOL II MacGregor Dwg. MacGregor Installation Check List

VOL II MacGregor Dwg TR41002 Installation of Plug in Elevator

B. Install the Owner Furnished Materials. Installation shall be in strict accordance with all applicable regulatory requirements. Washington State Ferries will provide the services of MacGregor Technical Representative for twenty (20) calendar days. This will include up to three (3) visits. The first will be for the lifting and positioning of the elevator. Contact Kari Laukia at MacGregor Finland, phone 358.24121.460 to schedule the technical visits. During these technical visits provide direct support to the MacGregor Representative.

C. Clean and gas free all spaces associated with the Work as necessary, and obtain a Marine Chemist Certificate for "SAFE FOR HOT WORK". Maintain the certificate during the course of the work.

NOTE:
For bidding purposes assume 200 man-hours will be required. This Item will be adjusted upwards or downwards to account for the actual labor hours required by the MacGREGOR-KONE Technical Representatives.

NOTE:
Washington State Ferries will provide the required Elevator installation Certificate(s)/Permit(s) from the Washington State Department of Labor and Industries. Inspections required by the permit will be arranged by the Contractor directly with Labor and Industries.

D. Transport the elevator from WSF warehouse at 6000 6th Ave South. WSF will provide on load handling at the pick up location. Notify the WSF Inspector forty-eight (48) hours prior to the pick up time. Off-load at the Contractor's facility, inspect, and install, the new elevator. Inventory all parts shipped with the elevator. Provide an inspection and inventory report to the WSF Inspector upon receipt. Store the elevator in a dry environment at all times with the heater connected.

E. The bulkheads, overheads, and framing in the Void are presently coated with a "KEL-KOTE" Coal Tar compound. Provide labor, material and equipment to prepare to SSPC-SP 3, Power Tool Cleaning and recoating as directed below, only those areas disturbed by the Work. Furnish and apply a hand-striped coat of INTERNATIONAL, Intertuf 262, Black, to a minimum of 5 mils (DFT) to the backsides, corners and sharp edges of all angles, rat holes, weld seams, scallops, and beams within the prepared area. Furnish and apply one (1) full coat of INTERNATIONAL, Intertuf 262, gray, to a minimum of 6 mils (DFT) to areas prepared above. New deck nonskid for the MES station and ADA parking shall be as shown on **VOL II** WSF Dwg 8201-652-024-02.

F. Clear and relocate/reinstall all interferences associated with the elevator installation. Remove power panel LP-2 as Category “D” from the cleaning gear locker. Locate new power panel LP-2 in the new stairway. Any cables not reaching shall be replaced to the first junction. Relocate the remote hydraulic watertight door reservoir as shown on **VOL II** WSF Dwg. 8201-652-004-01. Flush all disturbed piping, and test the operation of the door to the satisfaction of the Vessel Staff Chief Engineer, the WSF Inspector, and the USCG Inspector.

G. Reroute the 6” copper nickel sewage line and the 2” flushing and drain lines in the void around the new installation. Remove all sheathing, joiner work, deck coverings, and ceilings in way of installation. Modify and renew as required to suit the new installation and reinstall. For joiner work modifications see **VOL II** WSF Dwg 8201-652-003-02. Reroute the auto deck sprinkler piping around the new elevator trunk.

H. Move the Motor breaker panel inboard to allow the installation of the elevator trunk.

I. All connections between aluminum and steel shall be made with Detacouple (explosive bond strip), Huck™ bolts, or equal.

J. Dispose of the residual oil and remove the existing lube oil tanks in way of the elevator installation. Fabricate and install new lube oil tank as shown on, **VOL II** WSF Dwg 8201-652-078-01. Install the new lube oil piping as shown on **VOL II** WSF Dwg 8201-652-057-01.

K. Install the WSF provided elevator trunk as indicated on **VOL II** WSF Dwg 8201-652-003-01, **VOL II** WSF Dwg 8201-652-003-02, **VOL II** WSF Dwg 8201-652-004-01, **VOL II** WSF Dwg 8201-652-012-01, **VOL II** WSF Dwg 8201-652-095-05, **VOL II** WSF Dwg 8201-652-092-01, **VOL II** WSF Dwg 8201-652-090-01, **VOL II** WSF Dwg 8201-652-090-02,**VOL II** WSF Dwg 8201-652-057-01, **VOL II** MacGregor Dwg. TR21002, **VOL II** MacGregor Dwg. H304660, **VOL II** MacGregor Dwg. H304660-op1, **VOL II** MacGregor Dwg. 823893E00, **VOL II** MacGregor Dwg. 823896, **VOL II** MacGregor Dwg. Elevator Trunk Installation Instruction, **VOL II** MacGregor Dwg. IN21002, **VOL II** MacGregor Dwg. LI21002, **VOL II** MacGregor Dwg. MacGregor Installation Check List, and **VOL II** MacGregor Dwg TR41002.

L. When landing the elevator, the Vessel shall be on an even keel. List or trim control blocks may be used. Provide a weld procedure to the WSF Inspector prior to beginning installation. Install a foundation and all stabilizing supports, shown on **VOL II** WSF Dwg 8201-652-003-02, for the new WSF furnished Passenger Elevator. All structure shall be designed and built in accordance with ABS rules.

M. Install 2”x 2” angle iron at the bottom of each opening in the elevator trunk to support the aluminum threshold.

N. Install a mechanical ventilation system for the elevator trunk as shown on **VOL II** WSF Dwg 8201-652-012-03. The fan shall be mounted in the overhead of the lower car deck. The fan will take suction on the elevator trunk and exhaust to the car deck. Install a closure device on the elevator natural supply. See **VOL II** WSF Dwg 8201-652-090-01 for electrical installation requirements.

O. Modify the motor room ventilation exhaust louvers as shown on **VOL II** WSF Dwg 8201-652-003-01, **VOL II** WSF Dwg 8201-652-003-02, and **VOL II** WSF Dwg 8201-652-012-03.

P. Modify the existing sprinkler system piping as required to accommodate installation of the new passenger elevator. Any disturbed portions of the sprinkler system shall be thoroughly cleaned and flushed prior to reinstallation of the sprinkler heads. Sprinkler heads shall be arranged so that no portion of the overhead is more than seven feet (7) from a sprinkler head. Any sprinkler heads damaged shall be replaced in kind.

Q. Modify the hydraulic system for the watertight door between Engine Room No. 1 and Motor Room No. 1 as shown on **VOL II** WSF Dwg 8201-652-004-01.

R. Modify the return plenum for the main passenger cabin in way of the new installation. Using similar materials blank the exhaust ducting from frame 45 to frame 40 and remove the inlet grills. Enlarge the remaining three (3) return grills to 21” by 16”. Replace the ducting from the grills to exhaust plenum 18” by 8” ducting.

S. Install a two-inch (2") gravity drain pipe with a ball valved termination from the elevator pit bilge in the bottom of the elevator to below the deck plates in the motor room. Provide a removable screen over the elevator pit drain.

T. Install a Texas Deck drain, as shown on **VOL II** WSF Dwg 8201-652-003-02. The new drain piping shall be tested by filling to overflow with clean water. Acceptable tightness shall exhibit no leaks over a ten (10) minute period.

U. Provide new non-ACM bulkhead paneling and joiner work similar to surrounding the elevator trunk in the passenger cabin. The color is to match the surrounding bulkheads in the passenger cabin on the exposed side, as shown on **VOL II** WSF Dwg 8201-652-003-027. Continuously weld the doorframes and filler pieces around each levels door openings. Frames are shipped tack welded to the elevator trunk and will require final positioning before seal welding. Install new power assist door opener as shown on **VOL II** WSF Dwg 8201-652-003-02.

V. The installation shall include all wiring and wire runs for electrical power, lighting, and communications as shown on **VOL II** WSF Dwg 8201-652-090-01, **VOL II** WSF Dwg 8201X-509-095-01, **VOL II** WSF Dwg 8201-652-095-05, **VOL II** WSF Dwg 8201-652-099-01,**VOL II** MacGregor Dwg. 823893E00, Kone Elevator, Dwg. No. 823893E00, **VOL II** MacGregor Dwg. 823896, **VOL II** WSF Dwg. 8201-509-95-01 and **VOL II** WSF Dwg 8201-652-095-05. Locate an electrical outlet in the equipment area of the elevator trunk. The AIPHONE shall be located in the EOS.

NOTE: All cabling requirements, procedures, and installation shall meet the requirements for cabling as set forth in Work Item 5 and **VOL II, WSF 002 Electrical Installation Specifications**. Call buttons and indicator lights will be shipped loose to install in the new joiner work. Install Glamox six (6) fluorescent fixtures, 2x17w, 120vac, 60hz with clear polycarbonate diffusers in the elevator trunk. Locate one (1) fixture at each landing level, pit and equipment area at the top. Modify upper passenger deck lighting as shown on **VOL II** WSF Dwg 8201-652-092-01.

W. Install new elevator signage as shown on **VOL II** WSF Dwg 8201-652-024-01.

X. Prepare all disturbed paint surfaces (other than KEL-KOTE areas addressed above) to an SSPC-SP 3, Power Tool Cleaning and apply one (1) coat of International Intertuf 262, Buff, at a minimum of 6 mils (DFT). Apply one (1) final coat of International Intercare 755, of matching color for area, at a minimum of 2 mils (DFT), to cover. Repair all coatings damaged by the work to match original finish.

Y. Install WSF provided structural fire protection insulation to the entire interior of the elevator trunk on installed pins.

Z. Replace all disturbed structural, thermal, and acoustical insulation to match original installation. Repair all interior finish coatings and linings damaged by the work to match original finish and treatment. Repair disturbed Passenger Deck USCG A-30 structural fire protection underlayment to a level deck configuration and renew deck coverings to match original.

AA. TESTING

1. Conduct a vacuum box test on the new deck inserts. No leakage is allowed.

2. WSF will provide the services of a Factory Representative for verification of installation, start up and testing using, a MacGregor Test Report, and a MacGregor installation checklist as a guide. Provide certified weights for the Factory Representative to adjust and calibrate the elevator and for testing.

3. The Factory Representative will be present at light off and during load testing. The Contractor shall provide a minimum of two (2) weeks notice prior to initial light off to the WSF Inspector. Testing of the elevator shall demonstrate, at a minimum, the following:

   a. Satisfactory operation of the unit at its rated speed.

   b. Proper operation of the start and stop controls at all levels.

   c. Normal operation of all alarms.

   d. Proper temperatures are maintained during the load test.

   e. Proper functioning of all safety, shutdown, and auto-start devices.

4. Verify that all installed systems operate as intended. This includes all system components, all safety devices, and all alarms, monitoring, and control devices and the new power assist door opener. Demonstrate the correct operation to the WSF Inspector and Labor and Industries Inspector. The Contractor shall schedule five (5) days for accomplishment of this grooming/certification and testing task.

5. Test the emergency intercom between all stations.

6. Hydro test all modified piping systems to 150% of operating pressure.

20. SATELLITE COMPASS INSTALLATION
[NAVIGATION]

A. GENERAL:

1. The Work Item describes the installation of the Satellite Compass.

2. The installation of the WSF supplied Satellite Compass, shall be accomplished in accordance with this specification and the following drawings:

   VOL II WSF Dwg. 8201-647-015-01 M/V HYAK, Antenna Foundation for SC 110 Satellite Compass Location & Construction.

   VOL II WSF Dwg. 8201-647-094-01 M/V HYAK, Satellite Compass Installation Wiring Diagram.

   VOL II WSF DWG. 8201-652-090-05 M/V HYAK, Pilot House 24 VDC Distribution System Mods.

B. Install the WSF furnished Satellite Compass Antenna on top of the No. 1 End mast as shown on **VOL II** WSF Dwg. 8201-647-015-01. Orientation of the antenna to the Vessel fore and aft line is critical.

C. Modify the existing Pilothouse 24V DC system as required by **VOL II** WSF DWG. 8201-652-090-05.

D. Relocate the existing radio and telephone antennas from the top of the mast to a location on the aft end of the pilot house overhead on Contractor provided foundations, exact location as designate by the WSF Construction Master. Provide and install new watertight penetrations in the aft bulkhead of the pilothouse of the size and type to allow the antenna leads to pass through.

E. Install cable run from new antenna down the mast to the aft bulkhead of the pilothouse. Provide and install new watertight penetrations in the aft bulkhead of the pilothouse of the size and type to allow the antenna leads to pass through.

F. Install the SC-1101 Processor unit in the pilot house in location designated by the WSF Representative and as shown on **VOL II** WSF Dwg. 8201-647-094-01. The orientation of this unit to the Vessel fore and aft line must be +or- 2.5 degrees. The unit must be mounted parallel to the base line of the Vessel.

G. WSF will provide the services of an electronics Contractor to make the final terminations.

H. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP3, Power Tool Cleaning. Coat exterior surfaces with a minimum of two (2) 4 mil (DFT) coats of International Intertuf 262 series epoxy. Hand-stripe all edges. Topcoat with 2 mils (DFT) of International ES series epoxy, color to match existing colors. Coat interior surfaces with INTERNATIONAL INTERTUF 262, to obtain a minimum of 6 to 8 mils DFT. Hand-stripe all edges. Apply a minimum of 2 mils (DFT) International Intercare 755 finish coat to match surrounding color.

21. RADAR REPLACEMENT
{NAVIGATION}

A. GENERAL:

1. The Work Item describes the replacement of the radars.

2. The installation of the WSF supplied radars, shall be accomplished in accordance with this specification and the following drawing:

   VOL II WSF Dwg. 8201-652-090-05 M/V HYAK, Pilothouse 24 VDC Distribution System Modification One-Line Diagram.

3. Remove radar units. Remove 2 Units designated by the WSF Inspector as **Category "A"** and remove 2 units designated by the WSF Inspector as **Category "C**".

B. Remove existing radar foundations **as Category "C"**

1. Remove deck tile and underlayment as necessary.

2. Removal all structural, thermal, and acoustical insulation as necessary.

C. Install new foundations and the two (2) new WSF furnished radars, exact location shall be as per the Vessel Construction Master.

D. Install the two (2) existing radar units previously removed as **Category "C",** one (1) in each pilothouse on Contractor furnished foundations, exact location shall be as per the Vessel Construction Master.

E. Replace all deck tile and underlayment to match original installation.

F. Replace all disturbed structural, thermal, and acoustical insulation to match original installation.

G. Prepare all areas of new installation and damaged paint affected by this Item, to SSPC-SP3, Power Tool Cleaning. Coat exterior surfaces with a minimum of two 4 mil (DFT) coats of International Intertuf 262 series epoxy. Hand-stripe all edges. Topcoat with 2 mils (DFT) of International ES series epoxy, color to match existing colors. Coat interior surfaces with INTERNATIONAL INTERTUF 262, to obtain a minimum of 6 to 8 mils DFT. Hand-stripe all edges. Apply a minimum of 2 mils (DFT) International Intercare 755 finish coat to match surrounding color.

22. WIRELESS LAN INSTALLATION [IT]

A. GENERAL:

1. The Work Item describes the installation of the Wireless LAN.

2. The installation of the Wireless LAN, shall be accomplished in accordance with this Specification and the following drawings:

VOL II WSF Dwg. 8201-642-095-01 M/V HYAK, Super LAN /Security & Surveillance Wireless Over Water Installation

VOL II WSF Dwg. No. 8201-652-090-1 M.V. HYAK, Electrical One-Line Diagram

VOL II WSF Dwg. No 8201-624-003-01 AIS Antenna Foundation Installation & Details

B. Install new fiber optic LAN and antennas as shown on **VOL II** WSF Dwg. 8201-642-095-01.

NOTE:
Wherever new penetrations are required they shall maintain the watertight and fire ratings of the bulkhead or deck being penetrated. Existing non-poured bulkhead and deck penetrations may be reused. New Multi-Cable Transits shall be Nelson type. Test all deck, bulkhead and hull penetrations in company with and to the satisfaction of the USCG and WSF Inspector, and the Staff Chief Engineer.

C. Install new cables required by **VOL II** WSF Dwg. 8201-642-095-01. Insure cables and wires installed by this ITEM are run and marked, and continuity tests are made in accordance with **VOL II**. WSF 002.

D. Install foundations and antennas as required on **VOL II** WSF Dwg. 8201-642-095-01, welding shall be in accordance with **VOL II**. WSF 002.

E. WSF will provide the services of a licensed electronics Contractor to mount the OFE equipment, perform final terminations and system check out.

F. Prepare all surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. Furnish and apply one (1) anticorrosive coat, International Intertuf 262, to obtain a minimum of 6 to 8 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges. Top-coat with International Intercare 755, to a minimum 2 mils (DFT) to match surrounding surfaces.

23. SECURITY SYSTEM INSTALLATION

[SECURITY]

A. GENERAL:

1. The Work Item describes the installation of the Security system.

2. The installation of the Security system, shall be accomplished in accordance with this specification and the following drawings:

VOL II WSF Dwg. No. 8201-652-012-04 M/V HYAK Security Equipment Enclosure Ventilation Arrangement & Details

VOL II WSF Dwg. No. 8201-639-025-01 M/V HYAK, Security Equipment Enclosure Arrangement and Details

VOL II WSF Dwg. No. 8201-639-095-01 M/V HYAK, Homeland Security Plan

VOL II WSF Dwg. No. 8000-639-095-01 M/V HYAK, Homeland Security Typical Wiring Diagram Standard

VOL II WSF Dwg. No. 8201-639-095-02 M/V HYAK, Homeland Security Cabling & Wiring Diagram

VOL II WSF Dwg. No. 8000-639-095-02 M/V HYAK, Homeland Security Plan Typical Foundations Standard

VOL II WSF Dwg. No. 8201-642-095-01 M/V HYAK, Super Lan /Security & Surveillance Wireless Over Water Installation.

VOL II WSF Dwg. No. 8201-652-090-1 M.V. HYAK, Electrical One-line

VOL II WSF Dwg. No. 8201-639-090-1 M.V. HYAK, Electronic Equipment Room Electrical Room Electrical Installation Upper Passenger Deck

B. Install security modifications shown on **VOL II** WSF Dwg. No. 8201-652-012-04, **VOL II** Dwg. No. 8201-642-095-01, **VOL II** WSF Dwg. No. 8201-639-025-01, **VOL II** WSF Dwg. No. 8201-639-095-01, **VOL II** WSF Dwg. No. 8000-639-095-01, **VOL II** WSF Dwg. No. 8201-639-095-02, **VOL II** WSF Dwg. No. 8000-639-095-02, and **VOL II** WSF Dwg. No. 8201-652-090-1.

NOTE:
WSF supplied items on VOL II WSF Dwg. No. 8201-639-095-02.

C. The locksets will be provided by WSF.

NOTE:
Wherever new penetrations are required they shall maintain the watertight and fire ratings of the bulkhead or deck being penetrated. Existing non-poured bulkhead and deck penetrations may be reused new Multi-Cable Transits shall be Nelson type. Test all deck, bulkhead and hull penetrations in company with and to the satisfaction of the USCG and WSF Inspector, and the Staff Chief Engineer.

D. Fabricate equipment cabinet and electronic security devices foundations and camera mounts in the locations shown on **VOL II** WSF Dwg. No. 8000-639-095-02.

E. Install new cables required by **VOL II** WSF Dwg. No. 8000-639-095-02**, VOL II** WSF Dwg. No. 8000-639-095-01**, VOL II** WSF Dwg. No. 8201-639-095-02**, VOL II** WSF Dwg. No. 8201-642-095-01**,** and **VOL II** WSF Dwg. No. 8201-652-090-01.

F. Insure cables and wires installed by this ITEM are run and marked, and continuity tests are made in accordance with **Attachment No. 2, WSF 002 Electrical Installation Specifications.**.

G. Obtain the services of ABSCO Alarms (206) 367-1166 to make all connections and demonstrate the operation of the system.

H. Install stud runs and penetrations, run cables and install the security hardware and electrical components as shown on **VOL II** WSF Dwg. No. 8201-639-095-02.

I. Install Security Room as shown on **VOL II** WSF Dwg. No. 8201-639-025-01and **VOL II** WSF Dwg. No. 8201-639-090-01.

J. Remove existing plug-in electrical receptacle and associated cable on the Upper Passenger Deck in way of the new Security Room as shown on **VOL II** WSF Dwg. No. 8201-639-095-02. Remove existing potable water line (valved & plugged) adjacent to the existing electrical receptacle on the Upper Passenger Deck in way of the new Security Room. Remove potable water line back to the nearest connection in the Lower Passenger Deck overhead and plug or cap. Remove the deck penetrations for both the electrical cable and the potable water line and reinsert the deck plate in accordance with the Specifications.

K. Install the ventilation system for the Security Room as shown on **VOL II** WSF Dwg. No. 8201-652-012-04.

L. Replace all disturbed structural, thermal, and acoustical insulation to match original installation.

M. Prepare all surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. Apply one (1) anticorrosive coat, International Intertuf 262, to obtain 6 to 8 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges. Topcoat with International Intercare 755, to a minimum of 2 mils (DFT) to match surrounding surfaces.

24. SEARCHLIGHTS INSTALLATION
[MAINTENANCE]

A. GENERAL:

1. The Work Item describes the installation of the Search Lights.

2. The installation of the two Searchlights, shall be accomplished in accordance with this specification and the following drawings:

VOL II WSF Dwg. No. 8201-652-003-04 M/V HYAK New 500 Watt Searchlight Foundation Structural Arrangement and Details.

VOL II WSF Dwg. No. 8201-652-090-1 M.V. HYAK, Electrical One-line.

VOL II WSF Dwg. No. 8201-652-092-02 M/V HYAK, 500 Watt Searchlight wiring Diagram.

B. Existing incandescent searchlight installations are to remain.

C. Pick up WSF supplied searchlights; power supplies and control panels from the WSF 6th Avenue warehouse, and deliver to the Contractor's facility.

D. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK". Maintain the certificate during the course of the Work. Provide fire watches as required.

E. Relocate GPS antenna and cabling in accordance with the referenced drawing. Insert holes and hose test.

F. Install searchlight support headers in each pilothouse in accordance **VOL II** WSF Dwg. No. 8201-652-003-04. Construct and install two (2) new searchlight foundations with junction boxes in accordance with the referenced drawing. Locate junction boxes to permit 185-degree searchlight rotation from dead ahead to dead astern port or starboard sides using factory supplied flexible cables. Mount searchlights on new foundations using 316L stainless steel fasteners.

G. Install a 24"x24" stainless steel shelf between radar consoles in each pilothouse. The shelf should have a raised 8" by 10" long section forward to accept new searchlight controls. The forward part of the shelf should have a 4" flange extending downward. Relocate existing two (2) microphone holders to the flange. Relocate the tandem radio set (VHF/800MGHZ) to the lower section of the shelf, aft of the new searchlight controls.

H. Mount a WSF supplied searchlight power supply in each pilothouse in accordance with the reference drawing. Mount one (1) WSF supplied control assembly and three (3) WSF supplied remote control stations in each pilothouse in accordance with the referenced drawing. Relocate any

interferences as directed by WSF Inspector.

I. Disconnect and remove final emergency power panels EL3 in pilothouse No. 1 and EP2 in pilothouse No. 2. Install, connect and label two (2) new final emergency power panels in accordance with the referenced drawing. Test all reconnected circuits for proper operation.

J. Install new cables, terminals, and circuit breakers in each pilothouse in accordance with **VOL II** WSF Dwg. No. 8201-652-092-02 and **VOL II** WSF Dwg. No. 8201-652-090-1.

K. New cables are to be banded and tagged in accordance with the VOL II WSF Dwg. No. 8201-652-092-02.

L. Wherever new penetrations are required they shall maintain the watertight and fire ratings of the bulkhead or deck being penetrated. Hose test new exterior penetrations to insure water tightness.

NOTE:
The Contractor is cautioned, that there are poured transits located throughout the existing wire ways on this Vessel. These transits are not to be disturbed. Any existing cables that are required to be removed from these poured transits shall be cut off at the nearest hanger on each side of the transit, leaving a short pigtail. The pigtail shall be sealed with a heat shrink boot, and the entire length of the cut cable running through the transit cable shall be painted RED.

L. Test the searchlight installations from all control stations to insure proper installation.

M. Prepare new and disturbed areas in way of this work to an SSPC-SP 3, power tool cleaning. Coat with one (1) coat of INTERNATIONAL Intertuf 262 Epoxy, 5 mils (DFT); apply a topcoat of INTERNATIONAL Intercare to a minimum of 2 mils (DFT) to match existing color.

25. SEWAGE LIFT TANK REMOVAL & LOWER VEHICLE DECK RESTROOM REMOVALS
[PROPULSION SYSTEM]

A. GENERAL:

1. The Work Item describes the removal of the existing sewage lift tanks and the modification of the sewage piping system.

2. The removal of the existing sewage lift tanks and the modification of the sewage piping system, shall be accomplished in accordance with this specification and the following drawings:

VOL II WSF Dwg. No. 8201-652-011-01 M/V HYAK Soil & Plumbing Drain Modification

VOL II WSF Dwg. No. 8201-652-090-02 M/V HYAK Electrical One-Line Ripout

B. Remove the lavatory sink, water closet, water closet partition with door, and miscellaneous lavatory related items as **Category D** from the existing restroom on the Lower Vehicle Deck, port side, as shown on **VOL II** WSF Dwg. No. 8201-652-011-01. Piping shall be removed as noted on the Drawing. Brackets, foundations, and restraints for all removed equipment, furnishings, and piping shall also be removed. Properly insert the deck and bulkheads in way of all penetrations for removed piping and equipment. Restore bulkhead and deck finishing's in way of all removals. Remove existing signage denoting the space as a restroom (**Note:** this space shall be reassigned as a miscellaneous storage locker).

C. Clean and gas free all spaces associated with the Work as necessary, and obtain a Marine Chemist Certificate for "SAFE FOR HOT WORK". Maintain the certificate during the course of the work.

D. Pump down all tanks. Clean, sanitize and gas free all tanks and piping, associated with the Work as necessary, and obtain a Marine Chemist Certificate for "SAFE FOR HOT WORK". Maintain the certificate during the course of the work.

E. Remove the two lift tanks as Category D and their associated piping and electrical cabling as shown on **VOL II** WSF Dwg. No. 8201-652-011-01 and **VOL II** WSF Dwg. No. 8201-652-090-02.

F. Prepare new and disturbed areas in way of this work to an SSPC-SP 3, power tool cleaning. Coat with one (1) coat of INTERNATIONAL Intertuf 262 Epoxy, 5 mils (DFT); apply a topcoat of INTERNATIONAL Intercare to a minimum of 2 mils (DFT) to match existing color.

26. BULKHEAD SIX SOUND DEADENING INSULATION [PROPULSION SYSTEM]

A. GENERAL:

1. The Work Item describes the installation of No. 1 and No. 2 End bulkhead 6 sound deadening insulation.

2. The installation of No. 1 and No. 2 End bulkhead 6 sound deadening insulation, shall be accomplished in accordance with this Specification.

B. Remove and dispose of all existing insulation in the areas receiving the new insulation.

C. Install insulation from engine room overhead to 12-inches above tank tops and from the longitudinal bulk outboard of the engineer's dayroom to the longitudinal bulkhead outboard of the machine shop. The insulation shall consist of a layer of US Coast Guard Approved 1-inch thick mineral wool 8 lb density covered by a lead acoustic barrier covered by US Coast Guard Approved 1" thick Mylar faced mineral wool 8 pound density. The insulation shall be fastened with steel pins welded on 12-inch centers and speed clips and caps. All stiffeners shall be wrapped in the same manor. All joints shall be taped.

D. Sheet metal paneling shall be installed over the new insulation from the bottom to a height of 6-feet above the deck plate level. The metal paneling shall be 0.032" thick perforated stainless steel sheet, with 0.045" diameter holes on 0.25" straight centers. Provide and install additional supports for the metal paneling as required. The paneling shall be attached as part of the installation to attach the new insulation.

E. Temporary removal all interferences necessary to accomplish this work. Reinstall all interferences removed upon completion of the work. Provide necessary stand offs for reinstallation of all interferences including but not limited to equipment, cables, wireways and piping.

F. Prepare all areas of new installation and damaged paint affected by this Item, to an SSPC-SP3, Power Tool Cleaning. Coat with one (1) coat INTERNATIONAL Intertuf 262 epoxy, 5 mils DFT and topcoat color to match the existing.

G. The Contractor shall provide and install new signs, tags and labels for all affected equipment, tanks, switches and valves. The material and scheme of the signs, tabs and labels shall be similar to existing.

H. Upon completion of all work in the spaces the Contractor shall prove proper operation of all reinstalled interferences to the WSF Inspector and the Vessel Staff Chief Engineer.

27. EXIT SIGN REPLACEMENT
[MAINTENANCE]

A. GENERAL:

1. The Work Item describes the removal of the existing exit signs and the replacement with non-electrical signs.

2. The removal of the existing exit signs and modification of the electrical system shall be accomplished in accordance with this Specification.

B. Remove the existing exit lights from the Passenger Deck, Gallery Deck and Sun Deck, twenty-four (24) fixtures total. Existing wiring shall be pulled back to the first junction box and removed.

C. All penetration shall be closed using US Coast Guard excepted means.

D. Provide and install new Self Illuminating Exit Signs part number LEX152RW manufactured by Evenlite, Inc., in the same locations as those removed. Provide and install appropriate brackets and trimming as required for the new lights.

E. All brackets and trim in areas exposed to the weather shall be stainless steel with stainless steel fasteners.

F. Prepare all surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. Apply one (1) anticorrosive coat, International Intertuf 262, to obtain 6 to 8 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges. Topcoat with International Intercare 755, to a minimum of 2 mils (DFT) to match surrounding surfaces.

28. LOWER PASSENGER CABIN WINDOW REPLACEMENTS
[INTERIOR PRESERVATION-TOPSIDE]

A. Remove and reinstall all interferences, including but not limited to, window sills, window surrounds and bulkhead panels in way of the new window installation in the passenger cabins, all new and disturbed areas in way of the work shall match the existing décor.

B. Remove and dispose of forty-two (42) windows on the lower passenger deck level as designated by the WSF Inspector.

C. Provide and install new windows the locations of the removed windows. The new windows shall be the clamp-in type Model PCM-1092-FX, manufactured by Pacific Coast Marine Industries, Inc. Heavy Duty, welded frame, radius corner aluminum, clamp-in fixed compression glazed, insulated glass consisting of ¼ inch clear, ½ inch air, ¼ inch clear tempered glass. Window frame extrusion shall be 6083 aluminum. Window frames and glazing stops shall be bent or mitered, seam welded, and sanded smooth prior to anodizing. Glazing stops shall be attached to the window frames with ¼ inch stainless steel machine screws with spacing at 4 to 6 inches center to center. Frame finish shall be clear anodized, and clamp ring frames shall have color coordinated vinyl fasteners trim. Windows shall be installed in accordance with the using manufacturers recommended procedure along with the manufacturers recommended sealants and bedding tape.

D. Prior to installing new windows, any cracks in the window mullion/ships structure shall be prepared and full penetration welded. In addition, all existing window fastener holes shall be completely plug welded with a procedure approved by the WSF Inspector. All welds shall be ground smooth.

E. Prior to installing new windows, prepare all areas of failed coating and all areas affected by this work to an SSPC-SP3, Power Tool Cleaning.

F. To prepared areas, apply two (2) coats of International 262, first coat gray and second coat buff to minimum of 5 mils (DFT) each coat.

G. To prepared areas, apply a Topcoat of International Intercare, to a minimum of 2 mils, (DFT) to match the surrounding area.

H. Provide ten (10) additional sets of window frame extrusions to WSF, they shall be label as to the Vessel name and fastened to a pallet and delivered to the WSF Eagle Harbor Facility.

29. NO. 1 END UPPER PASSENGER CABIN WINDOW REPLACEMENTS

[INTERIOR PRESERVATION-TOPSIDE]

A. Remove and reinstall all interferences, including but not limited to, window sills, window surrounds and bulkhead panels in way of the new window installation in the passenger cabins, all new and disturbed areas in way of the work shall match the existing décor.

B. Remove and dispose of twenty-three (23) windows on the No. 1 End upper passenger deck level as designated by the WSF Inspector.

C. Provide and install new windows the locations of the removed windows. The new windows shall be the clamp-in type Model PCM-1092-FX, manufactured by Pacific Coast Marine Industries, Inc. Heavy Duty, welded frame, radius corner aluminum, clamp-in fixed compression glazed, insulated glass consisting of ¼ inch clear, ½ inch air, ¼ inch clear tempered glass. Window frame extrusion shall be 6083 aluminum. Window frames and glazing stops shall be bent or mitered, seam welded, and sanded smooth prior to anodizing. Glazing stops shall be attached to the window frames with ¼ inch stainless steel machine screws with spacing at 4 to 6 inches center to center. Frame finish shall be clear anodized, and clamp ring frames shall have color coordinated vinyl fasteners trim. Windows shall be installed in accordance with the using manufacturers recommended procedure along with the manufacturers recommended sealants and bedding tape.

D. Prior to installing new windows, any cracks in the window mullion/ships structure shall be prepared and full penetration welded. In addition, all existing window fastener holes shall be completely plug welded with a procedure approved by the WSF Inspector. All welds shall be ground smooth.

E. Prior to installing new windows, prepare all areas of failed coating and all areas affected by this work to an SSPC-SP3, Power Tool Cleaning.

F. To prepared areas, apply two (2) coats of International 262, first coat gray and second coat buff to minimum of 5 mils (DFT) each coat.

G. To prepared areas, apply a Topcoat of International Intercare, to a minimum of 2 mils, (DFT) to match the surrounding area.

30. NO. 2 END UPPER PASSENGER CABIN WINDOW REPLACEMENTS

[INTERIOR PRESERVATION-TOPSIDE]

A. Remove and reinstall all interferences, including but not limited to, window sills, window surrounds and bulkhead panels in way of the new window installation in the passenger cabins, all new and disturbed areas in way of the work shall match the existing décor.

B. Remove and dispose of ten (10) windows on the No. 2 End upper passenger deck level as designated by the WSF Inspector.

C. Provide and install new windows the locations of the removed windows. The new windows shall be the clamp-in type Model PCM-1092-FX, manufactured by Pacific Coast Marine Industries, Inc. Heavy Duty, welded frame, radius corner aluminum, clamp-in fixed compression glazed, insulated glass consisting of ¼ inch clear, ½ inch air, ¼ inch clear tempered glass. Window frame extrusion shall be 6083 aluminum. Window frames and glazing stops shall be bent or mitered, seam welded, and sanded smooth prior to anodizing. Glazing stops shall be attached to the window frames with ¼ inch stainless steel machine screws with spacing at 4 to 6 inches center to center. Frame finish shall be clear anodized, and clamp ring frames shall have color coordinated vinyl fasteners trim. Windows shall be installed in accordance with the using manufacturers recommended procedure along with the manufacturers recommended sealants and bedding tape.

D. Prior to installing new windows, any cracks in the window mullion/ships structure shall be prepared and full penetration welded. In addition, all existing window fastener holes shall be completely plug welded with a procedure approved by the WSF Inspector. All welds shall be ground smooth.

E. Prior to installing new windows, prepare all areas of failed coating and all areas affected by this work to an SSPC-SP3, Power Tool Cleaning.

F. To prepared areas, apply two (2) coats of International 262, first coat gray and second coat buff to minimum of 5 mils (DFT) each coat.

G. To prepared areas, apply a Topcoat of International Intercare, to a minimum of 2 mils, (DFT) to match the surrounding area.

31. LOWER PASSENGER CABIN SETTEE CLEANING AND REUPHOLSTERY

{INTERIOR PRESERVATION-PASSENGER SPACES}

A. GENERAL:

1. The Work Item describes the cleaning of the existing 152 upholstered settees and the reupholstery of those found no longer serviceable in the lower passenger cabin.

B. All upholstered parts of the settees shall be cleaned and conditioned to a like new conditioned following the upholstery manufactures recommendations.

C. The WSF Inspector shall designate 10 percent of the settees to be reupholstered.

1. The settees shall be removed from the Vessel and reupholstered using the same material, color and style of that removed, and reinstalled using new stainless steel fasteners.

32. LOWER PASSENGER CABIN CHAIR CLEANING AND REUPHOLSTERY

[INTERIOR PRESERVATION-PASSENGER SPACES]

A. GENERAL:

1. The Work Item describes the cleaning of the existing 200 upholstered chairs and the reupholstery of those found no longer serviceable in the lower passenger cabin.

B. All parts of the chairs shall be cleaned and conditioned to a like new conditioned following the upholstery manufactures recommendations.

C. The WSF Inspector shall designate 10 percent of the chairs to reupholstered.

1. The chairs shall be removed from the Vessel and reupholstered using the same material, color and style of that removed, and reinstalled using new stainless steel fasteners.

33. UPPER PASSENGER CABIN SETTEE REUPHOLSTERY

[INTERIOR PRESERVATION-PASSENGER SPACES]

A. GENERAL:

1. The Work Item describes the reupholstered of the existing 41 settees.

B. The settees shall be removed from the Vessel and reupholstered using the same material, color and style of that removed, and reinstalled using new stainless steel fasteners.

34. RENEWAL OF LININGS IN UPPER PASSENGER DECK MEN'S RESTROOM

[MAINTENANCE -PASSENGER SPACES]

A. GENERAL:

1. The Work Item describes the renewal of the damaged bulkhead liner in the upper passenger deck men's restroom.

B. Remove the two (2) damaged bulkhead joiner panels and replace with new (non-Asbestos) panels shall be made of calcium-silicate and covered with a laminate to match the existing paneling.

C. Remove and reinstall all interferences, including but not partitions.

D. Prepare new and disturbed areas in way of this work to an SSPC-SP 3, power tool cleaning. Coat with one (1) coat of INTERNATIONAL Intertuf 262 Epoxy, 5 mils (DFT); apply a topcoat of INTERNATIONAL Intercare to a minimum of 2 mils (DFT) to match existing color.

35. AMERICANS WITH DISABILITY ACT (ADA) COMPLIANCE UPGRADES

[REGULATORY COMPLIANCE ADA]

A. This Item provides for improvements to the Passenger Cabin in support of ADA issues.

B. Coordinate this Item with the passenger deck refurbishment Items.

C. Signage

1. The Contractor shall provide Accessibility signs (blue background and white wheelchair sign), approximately 5" by 5", in the following locations.

a. In the promenade areas (both ends), at each outboard end (P/S) in a location designated by the WSF Inspector (four (4) locations).

b. In the passenger lounges at the four corners on the back, inboard end of the last bench seat and on the outboard bulkhead above in a location designated by the WSF Inspector (eight (8) locations).

c. In the cafeteria seating area, in way of the two (2) tables (P/S), nearby the cashier's area where the seats have been left out; on the table side and in the overhead above in a location designated by the WSF Inspector (four (4)

locations).

D. Drinking Fountains

1. Remove and replace two (2) existing drinking fountains in the Midships Lounges (P/S) with new barrier free ones in the same locations at correct height.

2. The new drinking fountains shall be HALSEY TAYLOR HAC8FS-Q, Stainless Steel. The rim height shall be located 32 5/8" above the deck covering. Modify the bulkhead support, supply and drain height as required for the new installations.

E. Door Sills

1. Sills on all doors to the weather at each end of the cabin/dining area, and at weather door at elevator, where the existing difference in elevation between the deck and the top of the sill is greater than ½", provide a built-up ramp with a 4:1 slope, the full width of the door on the weather side. The ramps shall be made from PolySpec Lite Latex. After curing, coat the ramps with non-skid, color to match existing. Before applying PolySpec, prepare the deck in accordance with the manufacturer's recommendations.

F. Coat hooks

1. Modify coat hooks in way of the designated wheelchair spaces on the Lower Passenger Deck and the Upper Passenger Deck, remove the nearest coat hooks (8 places) and relocate them in the same area as directed by the WSF Representative, 48" above the deck. Cover the existing holes for the hooks with stainless steel screws.

G. Braille signs

1. For each interior door on the Upper and Lower Passenger Decks, provide tactile identification signs with text identical to the sign on or adjacent to the door. These shall be manufactured and located in accordance with the WSF Signage Manual, Sign Type 4. The spaces involved are:

   a. On the LPD: Cleaning Gear Locker, Deck Gear locker, Ship's Office, Men's Restroom, Mobility Impaired Restroom, Women's Restroom.

   b. On the UPD: Men's Restroom, Women's Restroom, ADA Restroom, Cleaning Gear Lockers, Fan Room (2), Galley (2).

   c. Provide tactile identification signs on each elevator landing on the other decks the elevator serves manufacture and locate in accordance with the WSF Signage Manual, Sign Type 4.

36. LOWER PASSENGER DECK SERVICE SINKS REPLACEMENT [INTERIOR PRESERVATION]

A. Remove the existing Service sinks and faucets from the three (3) Lower Passenger Deck Cleaning Gear Lockers.

B. Install new foundations and floor mounted mop sinks in the cleaning gear lockers as shown on **VOL II** WSF Dwg 8201-652-020-01, MV HYAK, Lower Passenger Deck Service Sink & Fresh Water Piping Installation.

C. Modify the freshwater and drain piping as shown on **VOL II** WSF Dwg 8201-652-020-01.

D. Insert structural penetrations removed during the modifications with equivalent plate material and thickness.

E. Prepare all surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. Apply one (1) anticorrosive coat, International Intertuf 262, to obtain 6 to 8 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges. Topcoat with International Intercare 755, to a minimum of 2 mils (DFT) to match surrounding surfaces.

37. OVERHEAD RENEWAL NO. 1 END UPPER PASSENGER CABIN [INTERIOR PRESERVATION]

ASBESTOS WARNING

Existing deck tile, underlayment, and joiner panels contain asbestos of varying amounts. Tile, underlayment, and joiner panel removals shall be accomplished by licensed personnel in accordance with current Federal, Local and State environmental regulations. Removed materials shall be disposed of in accordance with current Federal, Local and State regulations.

NOTE:

The intent is to use the existing overhead grid work, overhead cove molding, signage, alarms, vent screens, and speakers. The Contractor shall modify as necessary in way of Contract work.

A. Map the ceiling grid, lighting panels, steam heater cover panels, ventilation terminals, and any overhead access openings to valves, connection boxes, and speakers.

B. Remove the overhead ceiling panels in the No. 1 End Upper Passenger Cabin. Remove all of the ceiling panels, ventilation panels and all appurtenances attached to the dropped ceiling to accomplish this work. Temporarily tie up alarms, switches, speakers and any other fixtures or devices resting on or connected to the ceiling.

C. All speaker covers and ventilation covers are to be powder coated. Color to match ceiling color.

D. Remove and reinstall interferences including but not limited to speakers, vents, signage and alarms necessary to complete the following work.

E. Remove and dispose of all the existing overhead panels in the Upper Passenger Cabin, No. 1 End.

F. The overhead panels contain **Asbestos** and shall be removed in accordance with all **Local, State and Federal Regulations**.

G. Clean all existing overhead grid work, trim and coaming to remove dirt and grease build up prior to installing panels.

H. Install new perforated aluminum ceiling panels. The ceiling panels shall be 0.080 inch thick sheet aluminum perforated panels with 0.125 inch staggered holes, with 25-30% open area, with ½" solid borders. Each panel shall be the same size as those removed. The overhead panels shall be isolated from the overhead grid using dielectric tape. Panels shall be attached using No. 8, Type B, square drive, self-tapping stainless steel screws with a maximum spacing of six (6) inches.

I. Clean and reinstall the overhead cove molding between the ceiling panels and the joiner panels and install new access covers in new paneling in all locations where they currently exist. Clean and reinstall the signage and alarms to the same locations they were removed from. Reinstall vent screens, and speakers to the same locations they were removed from. All overhead signs shall be mechanically fastened to the overhead. Signs mounted on vertical surfaces shall be mechanically fastened or glued in place. Double-sided tape shall not be used to attach any sign.

J. The new and reinstalled panels and screws shall be electrostatic painted with white alkyd enamel.

K. Screw heads shall be painted to match overhead panels prior to installation. After screw installation any coating system damage will be repaired.

L. Reinstall all of the signs, tags, and labels. All overhead signs shall be mechanically fastened to the overhead. Signs mounted on vertical surfaces shall be mechanically fastened or glued in place. Double-sided tape shall not be used to attach any sign.

M. Provide ten (10) spare ceiling panels and 200 ft. of T grid to the Vessel Staff Chief Engineer.

38. UPPER PASSENGER CABIN NO. 1 END LIGHTING
[INTERIOR PRESERVATION]

A. Map the ceiling grid, lighting panels and connection boxes.

B. Remove and dispose of the existing lighting fixtures and cables back to first junction box. Replace removed cable as shown on WSF DWG 8201-652-092-01 Upper Passenger Deck No.1 End Lighting Plan. Ground all subject fixtures back to associated power panels.

C. Replace all existing suspended ceiling fluorescent light fixtures. Replace existing with new fixtures as shown on WSF DWG 8201-652-092-01 Upper Passenger Deck No.1 End Lighting Plan. New fixtures shall be complete in every respect including having new PCB free ballast, lamps and diffusers installed. Wherever new penetrations are required, they shall maintain the watertight and fire ratings of the bulkhead or deck being penetrated.

D. The new fixtures will require new mounts.

E. Modify "T" grid as necessary to accept new lighting fixtures.

F. Reinstall all previously removed interferences, including speaker covers, vent covers, alarms ect. using new stainless steel fasteners.

G. Demonstrate overhead lighting operation to the satisfaction of the WSF Inspector and the Vessel Staff Chief Engineer.

H. Relamp entire overhead with appropriate tube for existing ballast in 4100 K color range immediately prior to redelivery.

I. Installation and operation to be to the satisfaction of the WSF and USCG Inspectors, and the Vessel Staff Chief Engineer.

39. REMOVAL OF PANELING IN NO. 1 END UPPER PASSENGER CABIN
[INTERIOR PRESERVATION-PASSENGER SPACES]

ASBESTOS WARNING

Existing deck tile, underlayment, and joiner panels contain asbestos of varying amounts. Tile, underlayment, and joiner panel removals shall be accomplished by licensed personnel in accordance with current Federal, Local and State environmental regulations. Removed materials shall be disposed of in accordance with current Federal, Local and State regulations.

A. Remove and inventory artwork and adjoining labels as **Category "A"** for later reinstallation. Provide one copy of the Inventory to the WSF Inspector. Store the artwork in secure climate controlled area.

B. Map the location, remove and reinstall all interferences required to complete this Item, including but not limited to receptacles, electrical panels, switches, vending machine foundations, coat racks, label plates, signs, notices, alarm bells, fire station boxes, bulletin boards, license holders, public address equipment, and plaques. All electrical cable shall be concealed behind panels. Electrical equipment shall be flush mounted. If existing electrical cable intended for reuse is too short, replace it from the source with new low smoke cable. Cable splices shall not be used. All new electrical cable shall be Low Smoke per MIL-C-24643A.

C. Remove as **Category "D**" and dispose all of paneling in No. 1 End Upper Passenger Cabin. The paneling removal is to include both above and below the Passenger Cabin windows, paneling on bulkheads, bench seat frames and paneling in the stairwells. The intent is to remove all paneling from the designated areas.

D. Remove all window trim as **Category "A"** for later reinstallation.

E. Prepare areas of corrosion on curtain plates, bulkheads and stiffeners to SSPC-SP3, Power Tool Cleaning.

F. Apply two (2) coasts of International Intertuf 262 Epoxy 2 mils (DFT) each to all areas prepared above.

G. Conduct joint steel survey with the WSF Inspector.

1. Steel replacement is covered under separate Item.

NOTE:
For bidding purposes assume 500 sq ft of bulkhead and curtain plate prepared and painted. The Contract Price will be adjusted upward or downwards to reflect any difference in area completed.

H. Prepare the new and disturbed areas in way of this work to an SSPC-SP 3, Power Tool Cleaning, featheredges. Coat with one (1) coat of INTERNATIONAL Intertuf 262 Epoxy, 5 mils (DFT). Finish coat to match the No. 2 End Upper Passenger Cabin.

40. PAINTING IN NO. 1 END UPPER PASSENGER CABIN
[INTERIOR PRESERVATION-PASSENGER SPACES]

A. Paint all surfaces not otherwise receiving a new finish, including but not limited to window surrounds, fire stations, doors, stanchions, bulkheads, decks, lifejacket lockers, storage lockers, cleaning lockers, electrical panels, and appurtenances located in the No. 1 End Upper Passenger Cabin.

B. All removed fire stations, brochure stand, interior trim, interior doors, stair tower doors, and promenade doors and frames shall be powder coated, color shall match the No. 2 End Upper Passenger Cabin.

C. All items not removed shall be coated, coating and color shall the No. 2 End Upper Passenger Cabin.

D. All new and reused flashing shall be powder coated, color to match the No. 2 End Upper Passenger Cabin.

E. Reinstall all of the signs, tags, and labels. All overhead signs shall be mechanically fastened to the overhead. Signs mounted on vertical surfaces shall be mechanically fastened or glued in place. Double-sided tape shall not be used to attach any sign.

41. INSTALLATION OF PANELING IN NO. 1 END UPPER PASSENGER CABIN

[INTERIOR PRESERVATION-PASSENGER SPACES]

A. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK". Maintain the certificate during the course of the Work. Provide fire watches as required.

B. Install thermal insulation above and below the Passenger Cabin windows on all weather bulkheads. The insulation shall consist of USCG Approved, Mylar faced 2-inch hull board fastened with pins on 12-inch centers on bulkhead plating and 1-inch hull board wrapped around beams and stiffeners. All joints shall be taped. Hold the bottom edge up 1-inch from the deck.

C. Install new paneling, new panels shall be of the same type and color as that in the No. 2 End Upper Passenger Cabin.

D. All new material shall meet the requirements of the USCG Regulations. Designated decorative surfaces shall be laminated to the panels.

E. New panels shall be securely held in place to prevent rattling. The panels shall be removable without destroying them. Paneling shall utilize a deck shoe and a "U" top channel. Deck shoes shall be mounted above the required underlayment. Joints in paneling behind booths shall be located behind the booth backs. A furring piece shall be installed at approximately 48" above the deck to provide stiffening. Spline joints shall not be caulked. The existing steel bulkheads are not flat and will require shimming the shoes and channels. Flash the paneling up to existing doors and fittings to provide a finished appearance. Fit up around handrails. Any metal pieces shall be prepared and powder coated, color as that in the No. 2 End Upper Passenger Cabin.

F. Shop drawings for the panel system shall be provided to WSF Inspector for approval. The drawings shall include panel attachments and removable joints details. **The Contractor shall not start installation of paneling until WSF has approved the shop drawings**.

G. Remove and reinstall all interferences required to complete the new panel installation, including but not limited to receptacles, electrical panels, switches, vending machine foundations, ceiling panels, "T" grid, coat racks, label plates, fire station boxes, alarm bells, bulletin boards, license holders, and plaques.

H. Seal at the bottom shoes with a suitable flexible sealant approved by the WSF Inspector, to prevent water damage to the panels and water penetration behind the panels.

I. Provide hinged access covers with latches to valves, fittings, connection boxes, switches, electrical panels, or any other commonly accessed object located behind the new paneling. Provide engraved phenolic labels on all access openings indicating what lies behind.

J. Reinstall window mullion covers using new fasteners.

K. Flash the paneling up to existing doors, and fittings to provide a finished appearance. Provide new foundations for hand railings so they finish properly in the new paneling.

L. Prepare new and disturbed areas in way of this work to an SSPC-SP 3, power tool cleaning, and feather all rough edges. Coat with one (1) coat of INTERNATIONAL Intertuf 262 Epoxy, 5 mils (DFT). Hand stripe edges. Apply 2 mils (DFT) finish coat color as that in the NO2 End Upper Passenger Cabin.

M. Provide spare panels and hardware to WSF. Provide five (5) pieces of each type of panel, five (5) pieces of full height panel connecting strips, five (5) pieces of full height panel end strips, five (5) pieces of full height panel interior corner molding, five (5) pieces of full height panel exterior corner molding, sixteen (16) liner feet of panel deck shoe and sixteen (16) linear feet of panel top channel. Strap materials to pallets and clearly identify materials as belonging to HYAK Passenger Deck interior. Inventory and attach an inventory to each indicating manufacturer, manufacturer's catalogue number, and manufacturer's color description. Provide a copy of the inventory to the WSF Inspector. Deliver materials to WSF Eagle Harbor facility, marked for Carpenter Shop. Provide 24 hour advanced notification to the WSF Inspector prior to delivery.

42. AMERICANS WITH DISABILITY ACT REST ROOM INSTALLATION

[REGULATORY COMPLIANCE ADA]

A. GENERAL

1. The intent of this Work Item describes is to specify the general and specific requirements for installing a new Americans with Disability Act rest room.

2. The installation shall be accomplished in accordance with this specification and the following drawings:

VOL II Dwg 8201-652-003-03 MV HYAK, New Unisex/ADA Upper Passenger Deck Structural Arrangement & Details

VOL II Dwg 8201-652-012-02 MV HYAK, New Unisex/ADA Restroom Ventilation Arrangement & Details

VOL II DWG 8201-652-024-01 MV HYAK Wayfinding Signage For New Elevator and Unisex Restroom Arrangement Details

VOL II Dwg 8201-652-025-01 MV HYAK, New Unisex/ADA Upper Passenger Deck Arrangement & Details

VOL II Dwg 8201-652-074-01 MV HYAK, New Unisex/ADA Restroom Upper Passenger Deck Piping Installation

VOL II Dwg 8201-652-090-01 MV HYAK, Electrical One Line Diagram

VOL II Dwg 8201-652-092-01 MV HYAK, Upper Passenger Deck No.1 End Lighting.

B. Install a new compartment on the upper passenger deck as shown on **VOL II** Dwg 8201-652-003-03 and **VOL II** Dwg 8201-652-025-01.

C. Install new non-ACM bulkhead paneling, similar to WILSONART plastic laminate D30-60, color to selected by the Vessel Construction Master on the interior as shown on **VOL II** Dwg 8201-652-025-01.

D. Install all new fittings and equipment as shown on **VOL II** Dwg 8201-652-025-01.

E. Connect the new toilet, urinal and sink to the Vessel existing plumbing and drain systems as shown on **VOL II** Dwg 8102-652-074-01. Extend all new piping into the new space using water and fire tight bulkhead sleeves as shown in **VOL II** Dwg 8201-652-074-01.

F. Install new convector as shown on **VOL II** Dwg 8201-652-025-01 and **VOL II** Dwg 8201-652-074-01.

G. Install new paper towel dispensers, toilet paper, mirror, fold down infant care station, toilet seat cover dispenser, grab rails, sanitary napkin dispenser, folding utility shelf, coat hook, child protective seat and liquid soap dispensers as shown on **VOL II** Dwg 8201-652-025-01.

H. Install new ventilation as systems as shown on **VOL II** Dwg 8201-652-012-02.

I. Install new Door with power assist as shown on **VOL II** Dwg 8201-652-025-01, **VOL II** Dwg 8201-652-003-03, **VOL II** Dwg 8201-652-090-01, and **VOL II** Dwg 8201-652-092-01.

J. Provide new equipment and wiring to install lighting new fluorescent fixtures with Magnetek Triad B232I120RH ballasts and Phillips TL80 rapid start F32 T8/TL 841 4100K tubes, outlets, hand dryer, and electronic flushing valves. New circuits are shown on Dwg 8201-652-092-01 and **VOL II** Dwg 8201-652-090-01.

K. Install new perforated aluminum ceiling system in-kind to that in the upper passenger cabin. The overhead panels shall be isolated from the overhead grid using dielectric tape. Panels shall be attached using #8, Type B, square drive, self-tapping stainless steel screws with a maximum spacing of six (6) inches.

L. Install overhead cove molding between the ceiling panels and the joiner panels and install new access covers in new paneling in all locations where they currently exist. Install vent screens.

M. The new panels and screws shall be electrostatic painted with white alkyd enamel.

N. Screw heads shall be painted to match overhead panels prior to installation. After screw installation any coating system damage will be repaired.

O. Prepare the new and disturbed areas in way of this work to an SSPC-SP 3, Power Tool Cleaning, featheredges. Coat with two (2) coats of INTERNATIONAL Intertuf 262 Epoxy, 3 mils (DFT) each of contrasting colors. Finish coat to match the No. 2 End Upper Passenger Cabin.

P. TESTING

1. Conduct a water test on the new exterior bulkheads and overhead. No leakage is allowed.

2. Hydro all new pipe to 150 % of working pressure.

3. Testing of the electrical installation will be covered under the control system.

43. REPLACE VEHICLE DECK STEEL
[STRUCTURAL PRESERVATION]

A. GENERAL

1. The intent of this Work Item describes is to specify the general and specific requirements for replace of vehicle deck steel.

B. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist Certificate for “SAFE FOR WORKERS”, and “SAFE FOR HOT WORK” for the same. Maintain the certificate during the course of the Work. Provide fire watches as required.

C. Crop out and renew Lower Vehicle Deck steel. Beam/stringer to plate connections shall be continuous welded to both sides in all areas of new deck steel.

D. Provide ABS mill certification, and ASTM certification for all new steel prior to moving steel onboard.

NOTE:
All vehicle and walkway curb voids and vehicle ramp ends are filled with rigid urethane foam, and may present harmful vapors when exposed to heat from a cutting torch.

E. Areas of deck to be replaced include:

1. End 2 starboard side upper vehicle deck in way of stair tower access; approximate size 8' x 8' x ¼" plate. **Note:** this may require curb removal and reinstallation. The WSF Inspector will designate exact location.

F. Frames to be replaced include:

1. Remove frames in their entirety from 12-inches below the upper vehicle deck to 5 feet above the upper vehicle.

2. Replace with 8" x 4" X 10lb I-T.

3. Remove and reinstall the curbing in way of work as needed to complete the work.

4. The Contractor shall provide a detailed sequence of the work that will prevent structural deformation of the curtain plate and or passenger deck to the WSF Inspector prior to commencement of removals.

   a. End 1 starboard upper vehicle deck ramp and upper vehicle deck frames 60 through 94 for a total of ten (10).

   b. End 1 port upper vehicle deck ramp and upper vehicle deck frames 60 through 94 for a total of ten (10).

   c. End 2 starboard upper vehicle deck ramp and upper vehicle deck frames 60 through 94 for a total of ten (10).

   d. End 2 port upper vehicle deck ramp and upper vehicle deck frames 60 through 94 for a total of ten (10).

   e. Remove and renew built up ride sections from the top of the curb to the upper cut line of the new frames on frames 60, 64, 68 and 72 in a four (4) above locations. The rider is cut on a taper, a ship check is recommended.

G. Remove and replace all interferences as required to complete this Work Item. The Contractor shall use protective fireproof cloth to protect the areas below the Lower Vehicle Deck inserts. Any damage to the paint from this hot work shall be repaired and painted by the Contractor. All debris associated with this Work shall be cleaned by the Contractor to the level of cleanliness of spaces prior to start of Work.

H. Test all new welds to the satisfaction of the USCG and the WSF Inspector.

I. Prepare to an SSPC-SP 3, Power Tool Cleaning, all areas of paint, yellow safety striping and non-skid damaged as a result of this Work Item, and coat with AMERON, Amercoat 235, Buff, to obtain a minimum of 6 mils (DFT), followed by a topcoat of AMERON, Amercoat 229 to obtain a minimum of 2 mils (DFT) of the proper color. Replace any damaged or removed non-skid with AMERON, Amercoat 237M to match the surrounding areas.

J. New steel shall be grit blasted to SSPC-SP 10, Near-White Blast Cleaning, and coated with an appropriate weld through primer, prior to installation on the Vessel. After installation, the interior side of new steel shall be coated with AMERON, Amercoat 235, Buff, to obtain a minimum of 6 mils (DFT), and top coated with AMERON, Amercoat 229 to obtain a minimum of 2 mils (DFT) of to match the surrounding area. The weather side of the new steel shall be painted to match the surrounding paint, and/or non-skid. Renew any safety stripes that may have been disturbed.

K. Develop sketches showing the exact locations of all steel repairs by frame numbers and square footage. Provide four (4) copies of all sketches to the WSF Inspector.

44. REPLACE VEHICLE DECK CURBING
[STRUCTURAL PRESERVATION]

A. GENERAL

1. The intent of this Work Item describes the general and specific requirements for the replacement of 600 feet of vehicle deck curbing in various areas of the vehicle deck.

NOTE:
All vehicle and walkway curb voids and vehicle ramp ends are filled with rigid urethane foam, and may present harmful vapors when exposed to heat from a cutting torch.

B. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist Certificate for “SAFE FOR WORKERS”, and “SAFE FOR HOT WORK” for the same. Maintain the certificate during the course of the Work. Provide fire watches as required.

C. Crop out and renew vehicle deck curbing in various areas of the vehicle deck. All welds shall be continues.

D. Provide ABS mill certification, and ASTM certification for all new steel prior to moving steel onboard.

E. Remove and replace all interferences as required to complete this Work Item. The Contractor shall use protective fireproof cloth to protect the areas below the Lower Vehicle Deck inserts. Any damage to the paint from this hot work shall be repaired and painted by the Contractor. All debris associated with this Work shall be cleaned by the Contractor to the level of cleanliness of spaces prior to start of Work.

F. Test all new welds to the satisfaction of the USCG and the WSF Inspector.

G. Prepare to an SSPC-SP 3, Power Tool Cleaning, all areas of paint, yellow safety striping and non-skid damaged as a result of this Work Item, and coat with AMERON, Amercoat 235, Buff, to obtain a minimum of 6 mils (DFT), followed by a topcoat of AMERON, Amercoat 229 to obtain a minimum of 2 mils (DFT) of the proper color. Replace any damaged or removed non-skid with AMERON, Amercoat 237M to match the surrounding areas.

H. New steel shall be grit blasted to SSPC-SP 10, Near-White Blast Cleaning, and coated with an appropriate weld through primer, prior to installation on the Vessel. The weather side of the new steel shall be painted to match the surrounding paint, and/or non-skid. Renew any safety stripes that may have been disturbed.

I. Develop sketches showing the exact locations of all steel repairs by frame numbers and square footage. Provide four (4) copies of all sketches to the WSF Inspector.

45. LOWER PASSENGER CABIN DECK TILE RENEWALS
{INTERIOR PRESERVATION-PASSENGER SPACES}

ASBESTOS WARNING

Existing deck tile, underlayment, and joiner panels contain asbestos of varying amounts. Tile, underlayment, and joiner panel removals shall be accomplished by licensed personnel in accordance with current Federal, Local and State environmental regulations. Removed materials shall be disposed of in accordance with current Federal, Local and State regulations.

A. Remove all interferences as required, including but not limited to newspaper racks, brochure racks, waste receptacles, seating, tables, vending machines and video games as **Category "C"** and provide secure, heated, dry storage for these items.

B. Remove and dispose of all the existing tile and underlayment in both No. 1 and No. 2 End Passenger Cabins as laid out by the WSF Inspector.

C. Prepare the decks to SSPC-SP6, Commercial Blast Cleaning with track blaster. Remove all traces of blast beads from all areas of the Vessel.

D. All areas that are inaccessible to a track blaster shall be prepared to SSPC-SP3, Power Tool Cleaning.

E. Apply two (2) coasts of International Intertuf 262 Epoxy 2 mils (DFT) each to all areas prepared above.

F. Install new underlayment in all areas of removed underlayment. The new underlayment shall provide A-30 structural fire protection. The underlayment is to be asbestos free and USCG approved. The underlayment system shall be Poly-Spec 7K or equal as approved by the WSF Inspector.

1. A second coat shall smooth hollows, low spots and other imperfections in the first coat of underlayment. Where a difference in height exists in way of doors to adjacent spaces the underlayment shall transition 18-inches and be gradually ramped down to the low area. When the underlayment is sufficiently dry, sand out the trowel ridges to provide a smooth surface for tile installation. No trowel ridges shall show through the tile within one year of installation.

2. Apply a full "skim coat" of PolySpec Lite Latex, or Ardex Feather Finish or an approved equal to the entire deck area being tiled. The skim coat shall provide a level and smooth surface for tile application. The Contractor shall warrant that the skim coat will not de-laminate from the underlayment, crack, or bubble during the warranty period. All or equal substitutions shall be approved by the WSF Inspector. The finished deck surface shall be flush with all doorsills and faired to account for deck camber.

G. Install new asbestos free deck covering to match existing. Installations methods and adhesives shall be as recommended or specified by the manufacturer, except that all adhesives shall be waterproof.

H. Install a four-inch (4") rubber cove base to match existing.

1. The Contractor shall guarantee the tile installation for one (1) year not to crack, de-laminate from the underlayment, or develop noticeable bumps, bulges, wave depressions or surface irregularities.

2. Upon completion of tile installation and just prior to Vessel redelivery, the Contractor shall clean and wax all new tile in accordance with the manufacturers' recommendations.

NOTE:

For bidding purposes assume 500 sq ft of deck tile and 150 sq ft of underlayment replacement in No.1 End and 100 Sq ft. of deck tile and underlayment replacement in No.2 End. The Contract Price will be adjusted upward or downwards to reflect any difference in area completed.

46. INSTALLATION OF LOWER PASSENGER DECK WALK OFF MATS

{ INTERIOR PRESERVATION-PASSENGER SPACES}

ASBESTOS WARNING

Existing deck tile, underlayment, and joiner panels contain asbestos of varying amounts. Tile, underlayment, and joiner panel removals shall be accomplished by licensed personnel in accordance with current Federal, Local and State environmental regulations. Removed materials shall be disposed of in accordance with current Federal, Local and State regulations.

A. Remove all interferences as required, including but not limited to newspaper racks, brochure racks, waste receptacles, seating, tables, vending machines and video games as **Category "C"** and provide secure, heated, dry storage for these Items.

B. Remove and dispose of all the existing tile and underlayment in both No. 1 and No. 2 End Lower Passenger Cabins adjacent to the four (4) pickle fork doors extending 3 feet beyond the door frames in the athwart ships directions and 8 ft from the doors in the longitudinal direction as laid out by the WSF Inspector.

C. Prepare the decks to SSPC-SP6, Commercial Blast Cleaning with track blaster. Remove all traces of blast beads from all areas of the Vessel.

D. All areas that are inaccessible to a track blaster shall be prepared to SSPC-SP3, Power Tool Cleaning.

E. Apply two (2) coasts of International Intertuf 262 Epoxy 2 mils (DFT) each to all areas prepared above.

F. Install new underlayment in all areas of removed underlayment. The new underlayment shall provide A-30 structural fire protection. The underlayment is to be asbestos free and USCG approved. The underlayment system shall be Poly-Spec 7K or equal as approved by the WSF Inspector.

1. A second coat shall smooth hollows, low spots and other imperfections in the first coat of underlayment. Where a difference in height exists in way of doors to adjacent spaces the underlayment shall transition 18-inches and be gradually ramped down to the low area. When the underlayment is sufficiently dry, sand out the trowel ridges to provide a smooth surface for tile installation. No trowel ridges shall show through the tile within one year of installation.

2. Apply a full "skim coat" of PolySpec Lite Latex, or Ardex Feather Finish or an approved equal to the entire deck area being tiled.

The skim coat shall provide a level and smooth surface for tile application. The Contractor shall warrant that the skim coat will not de-laminate from the underlayment, crack, or bubble during the warranty period. All or equal substitutions shall be approved by the WSF Inspector. The finished deck surface shall be flush with all doorsills and faired to account for deck camber.

3. Coat underlayment under walk off mats and for one tile width around the perimeter with epoxy sealer to make the underlayment waterproof.

G. The walk off mat shall be sized to extending 2-feet beyond the door frames in the athwart ships directions and 6-feet from the doors in the longitudinal direction as laid out by the WSF Inspector.

1. The walk off mats shall be Bonar Floors Coral Duo-Graphite 9110.

2. The mats shall be flush with the existing tile and be laid with the ribs running at right angles to the walking direction.

3. The mats shall be removable and flush with the existing tile.

4. Install walk off mat stainless steel transition strips with removable rubber flat top flush with the existing tile and capturing the outer perimeter of the mats.

5. Install new tile to match existing to all areas that were disturbed and that have not received a walk off mat.

47. RENEW UPPER PASSENGER CABIN DECK STEEL [MAINTENANCE /STEEL REPLACEMENT]

ASBESTOS WARNING

Existing deck tile, underlayment, and joiner panels contain asbestos of varying amounts. Tile, underlayment, and joiner panel removals shall be accomplished by licensed personnel in accordance with current Federal, Local and State environmental regulations. Removed materials shall be disposed of in accordance with current Federal, Local and State regulations.

A. GENERAL

1. The intent of this Work Item describes the general and specific requirements for the replacement of upper passenger deck steel.

B. Remove the deck coverings from on No.1 End of Upper Passenger Cabin Deck as laid out by the WSF Inspector. The deck covering shall be removed (transversely) 12-inches outboard of the inboard side of the door frame located on bulkhead 67, both port and starboard. Also remove the joiner panels and bulkhead insulation located above and below the windows on bulkhead 67 on No. 1 End and all interferences required to conduct a steel survey of the deck steel and lower 12 - inches of bulkhead 67. This survey shall include the deck inside of the stairwell voids on both ends.

C. While the area is contained for asbestos removal, remove the asbestos containing overhead panels from bulkhead 67 back to the frame ten (10).

D. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK." Maintain the certificate during the course of the Work.

E. After deck coverings have been removed, grit blast the uncovered decks to an SSPC-SP6, Commercial Blast Cleaning.

F. Upon completion of grit blasting the Contractor shall furnish the services of a certified UT Inspector to UT the decks as directed by the WSF Inspector and provide three (3) copies of a detailed report showing the exact locations of areas inspected. Provide a detailed sketch showing the size and the exact location of steel deck renewed using frame numbers. **Estimate for 100 UT readings**.

G. Coat all of the remaining uncovered deck steel (not renewed**),** and new deck steel with one (1) coat of International 262 to achieve a minimum of 6 mils DFT. The exterior side shall be top coated with 2 mils of International Intercare blue white. New steel shall be blasted to a SSPC-10, Near-white blast cleaning, and coated with Interplate 937 Nippe-Cerramo pre-construction primer, prior to installing.

H. The cost for steel removals shall be bid using lot pricing. The Contract will be adjusted upwards or downwards for actual amount installed. Lot prices shall include all labor, material, removal costs, installation costs, testing costs, preparation and painting costs associated with the steel renewals.

I. LOT (1)

1. Replace approximately 2,000 square feet of 7.65 pound deck steel on the Lower Passenger Cabin and Promenade Decks and associated longitudinals, Longitudinals are 3"x 1 7/8" x 2.2#T on 27-inch centers.

LOT (2)

1. Replace approximately 60 lineal feet of the lower 12 inches of steel on Bulkhead 67 below the windows with 7.65-pound plate.

J. LOT (3)

1. Replace the lower 12 inches of Stiffeners below the windows on Bulkhead 67 with 6”x1 7/8”x 4.4# I-T.

2. Install a flatbar two (2) inches above the deck onto bulkhead 67 to retain the insulation. The new insulation will be as existing (1½” unfaced thermal insulation No. 3 density with no beam wrap, “spintex” mineral wool, USCG approval No. 164.009 (non-combustible material). The size of the flat bar shall be 1/8” x 2”. Renew insulation pins as necessary.

3. Remove the furring that retains the bottom of the joiner panels and install a 3” x ¼” flat bar coaming. The new coaming shall be skip welded on the backside and continuous welded on the front side. Install a new furring piece to the top of the coaming in a manner that will allow the new joiner panels to be retained by screws at the bottom. This will allow the joiner panels to be installed without removing the windowsills.

4. Install new joiner panels on bulkhead 67 both No. 1 End (non-Asbestos). New panels shall be made of calcium- silicate and covered with a laminate to match the existing paneling along the outboard bulkheads.

5. Prepare to an SSPC-SP3, Power Tool Cleaning, the bulkhead surfaces behind the entire removed paneling and apply one (1) coat of International 262 at a minimum of 6 mil (DFT).

6. Renew all of the insulation below the passenger cabin windows on bulkhead 67.

7. Install new A-30 structural fire underlayment to meet USCG requirements to all areas where the underlayment has been removed. Topcoat the structural fire underlayment with a latex leveling compound meeting USCG requirements, following the manufacturers requirements to accommodate the installation of new tile. The new tile shall be faired to the adjacent tile.

8. Install new, Armstrong #51858, 12”x12”x 1/8”, asbestos free Mil-T- 18803B, vinyl composition tile deck covering to match existing.

9. Install new, Roppe standard cove toe base to match existing.

L. Develop sketches showing the exact locations of all steel repairs by frame numbers and square footage. Provide four (4) copies of all sketches to the WSF Inspector.

48. CREWS QUARTERS DECK STEEL REPLACEMENT [MAINTENANCE]

ASBESTOS WARNING

Existing deck tile, underlayment, and joiner panels contain asbestos of varying amounts. Tile, underlayment, and joiner panel removals shall be accomplished by licensed personnel in accordance with current Federal, Local and State environmental regulations. Removed materials shall be disposed of in accordance with current Federal, Local and State regulations.

A. Remove the deck coverings and underlayment from on No. 1 End Crew's Quarters and head Decks as laid out by the WSF Inspector.

B. Crop and renew all areas of wasted deck as laid out by the WSF Inspector.

1. For bidding purposes assume 200 sq ft of deck plate renewal, the Contract Price will be adjusted upward or downwards to reflect any difference in area completed.

C. All new steel shall be ABS Grade A or B. Steel shapes shall meet ASTM Standard A-36 requirements. All new steel shall be wheel-abraded or grit blasted to SSPC SP-10 and immediately primed with weld through primer that is compatible with the Vessel's coating system.

D. All disturbed areas and new plating shall be coated with two (2) coats, applied to a minimum of 3 mils (DFT) each, of Intertuf 262 epoxy and a top coat of to match surrounding areas.

E. Install new underlayment to all disturbed areas. The new underlayment shall provide A-0 structural fire protection. The underlayment is to be asbestos free and USCG approved. The underlayment system shall be Poly-Spec 7K or equal as approved by the WSF Inspector.

1. A second coat shall smooth hollows, low spots and other imperfections in the first coat of underlayment. Where a difference in height exists in way of doors to adjacent spaces the underlayment shall transition 18-inches and be gradually ramped down to the low area. When the underlayment is sufficiently dry, sand out the trowel ridges to provide a smooth surface for tile installation. No trowel ridges shall show through the tile within one year of installation.

2. Apply a full "skim coat" of PolySpec Lite Latex, or Ardex Feather Finish or an approved equal to the entire deck area being tiled or carpeted. The skim coat shall provide a level and smooth surface for tile application. The Contractor shall warrant that the skim coat will not de-laminate from the underlayment, crack, or bubble during the warranty period. All or equal substitutions shall be approved by the WSF Inspector. The finished deck surface shall be flush with all doorsills and faired to account for deck camber.

3. Install new deck coverings; coverings shall match existing.

4. Install a four-inch (4") rubber cove base to match existing.

F. The Contractor shall warranty the floor covering installation for one (1) year not to crack, de-laminate from the underlayment, or develop noticeable bumps, bulges, wave depressions or surface irregularities.

G. Upon completion of tile installation, the Contractor shall clean and wax all new tile in accordance with the manufacturers' recommendations.

49. STABILITY TEST
[MAINTENANCE]

A. When the Contract Work is reasonably complete, prepare for and conduct a Inclining Experiment in accordance with **USCG NVIC 17-91, Guidelines for Conducting Stability Tests/ASTM F 1321-90, Standard Guide for Conducting a Stability Test (Lightweight Survey and Incline Experiment) to Determine the Lightship Displacement and Centers of Gravity of a Vessel**.

B. The Contractor shall prepare and submit a stability test procedure as outlined in 46 CFR Part 170 to the US Coast Guard (USCG) Commanding Officer, Marine Safety Center for approval a minimum of four (4) weeks prior to the anticipated Ready for Trial date. A stamped, USCG-approved copy of the Stability Test Procedure shall be submitted to WSF.

C. Representatives of the USCG and WSF will witness the post-Preservation Inclining Experiment. The Contractor shall provide five (5) days notice of his intent to incline to WSF and USCG.

D. The Contractor shall prepare the Stability Test Data Report using General Hydrostatics (GHS) software, published by Creative Systems, Port Townsend Washington, and submit copies to the USCG and the WSF Representative for approval.

E. Submittal of the report to the USCG and WSF shall take place no later than five (5) working days after the completion of the inclining experiment.

F. Prepare and provide a Trim And Stability Booklet using the data provided by the inclining experiment. Submittal of this Report to USCG and WSF shall take place no later than ten (10) working days after the completion of the inclining experiment.

G. Final submittals of the Stability Test Data Report and the Trim and Stability Booklet by the Contractor shall include exact 3 ½ inch DS/HD disk magnetic media or CD disk files of both the reports and supporting data.

H. Final Acceptance, as defined in the Contract, will not be executed until delivery of the approved Stability Assessment Report, and Trim and Stability Booklet, and the USCG has issued a simplified Stability Letter (in accordance with 46CFR 170.120).

50. DOCK AND SEA TRIALS
[PROPULSION SYSTEM]

NOTE:
For scheduling purposes, assume Dock Trials will take two (2), ten (10) hour days.

A. WSF will provide deck and engine room trial crews. WSF will provide fuel for dock and sea trials. WSF will require one (1) workday to on load fuel and calibrate tanks prior to trials. The Contractor shall provide a boom for fuel on load if required by the facility.

B. The Contractor shall provide support services for Dock Trials, to be conducted by the Vessel personnel.

C. The Dock Trials of the propulsion controls shall be under the direction of the Vessel Staff Chief Engineer and to the satisfaction of the USCG Inspector, and the Vessel Staff Chief Engineer.

D. The Dock Trials of the steering control system shall be under the direction of the Vessel Staff Chief Engineer and to the satisfaction of the Matthews Marine Representative, the Vessel Staff Chief Engineer, and the USCG Inspector.

E. The Dock Trials of the new generators, Switchboard/MCC/AMS, new elevator, and watertight door automation/indication installations shall be under the direction of the Vessel Staff Chief Engineer and to the satisfaction of the USCG and WSF Inspector, and the Vessel Staff Chief Engineer and include the completion of the control system design verification test.

NOTE:
For bidding purposes, assume 100 labor hours will be required in support of the Dock Trial exclusive of deck crews to handle lines. The Contract will be adjusted upward or downward, using the actual hours expended.

NOTE: For scheduling purposes, assume Sea Trials will take one (1) ten (10) hour day.

F. The Contractor shall provide support services including tug and berthing services for Sea Trials, to be conducted by the Vessel personnel. For bidding purposes, assume that in addition to normal berthing tug assist a standby tug will be required to accompany the Vessel during the sea trials. The Contract will be adjusted upward or downward depending on actual standby services rendered.

G. WSF will provide deck and engine room trial crews. WSF will provide fuel for dock and sea trials.

H. The Contractor shall provide the services of a qualified compass adjustor to adjust and compensate magnetic compasses in No. 1 and No. 2 Pilothouses. WSF will swing ship during sea trials to accommodate the compass adjustments.

I. The Sea Trials of the main engines and propulsion controls shall be under the direction of the Vessel Staff Chief Engineer. These trials will demonstrate the performance of the main engines.

J. The Sea Trials of the steering control system shall be under the direction of the Vessel Staff Chief Engineer and to the satisfaction of the Matthews Marine Representative, the Vessel Staff Chief Engineer, Vessel Master and the USCG Inspector.

K. Accomplish an infrared survey by a certified infrared thermographer of all motor control centers, motor controllers, alternator and generator connections under full load. Provide three (3) copies of a report of conditions found to the WSF Inspector.

NOTE:

For bidding purposes, assume 120 labor hours will be required in support of the Sea Trial exclusive of deck crews. The Contract will be adjusted upward or downward, using the actual hours expended.

(END)